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[ORIGINAL COMMUNICATION.]

CRITICAL NOTES ON THE U. S. PHARMACOPŒIA.*

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Adeps Benzoinatus.—Hell ("Pharmaceut. Manuale," third edition) says: To prevent rancidity, it seems necessary to choose the proportion of 5 parts of benzoin to 100 parts of lard. Dieterich ("Pharmaceut. Manuale," second edition) gives this formula: 100 parts of lard freshly rendered, 10 parts each of Sumatra benzoin coarsely powdered and of finely powdered efflorescent sodium sulphate. The whole, having been previously mixed, is heated on a steam-bath for one hour, stirring constantly, strained, and finally filtered. The sodium sulphate serves a double purpose, viz., to free the lard from water and to prevent the conglomeration of benzoin. Finally benzoinated lard, according to Utescher (*Apoth. Zeit.*) prepared by digestion with benzoin, contains only the acid of the gum resin. It may be prepared, therefore, from the acid, sublimed from benzoin—one per cent—in a more simple manner, thereby furnishing an ointment of better color and consistence than by the old method, and of equal keeping qualities. But somewhere I found the remark that benzoinated lard made in this way is too irritating. I also doubt if Rother's view about the greater antizymotic power of balsam of tolu is correct. Dieterich (l. c.) gives a formula for making an antiseptic lard with balsam of tolu in the proportion of 1 : 10, but says that it does not keep as well as benzoinated lard.

Amylum Iodatum.—Dieterich (l. c.) gives his process: He first dissolves the iodine in ether, mixes this with the starch, dries at ordinary temperature, and preserves in well-closed vessels. He prefers the ether for two reasons: first, to shorten the time of drying; secondly, to reduce to a minimum the evaporation of iodine.

Aquæ Medicatæ.—If the process is changed, it would also be well to give processes for making them by distillation, for the benefit of those who have the facilities and who use large quantities of any one kind, because it cannot be denied that *distilled* waters are the best. Formulæ should also be given for making small quantities when wanted. Dieterich (l. c.) gives formulæ for such from solutions of the oils in alcohol, made in the proportion of 1 : 10, and uses 1 drop for 10 Gm. of water. Perhaps here the official spirits could be used, or, if the official process was changed to the hot-water process, we could instantaneously make up the smallest quantities, supposing—as it should be—that in a well-regulated pharmacy hot water is always at hand.

Language in Official Directions of Aqua Anisi, Cinnamomi, etc.—It is not clear from the wording what we should pack in a conical percolator, whether the oil or the cotton; the language is correct in Aqua Camphoræ.

Aqua Amygdalæ Amaræ.—The amount of hydrocyanic acid should by all means be adjusted to a fixed limit.

Aqua Aurantii Florum.—Hell (l. c.) says: For distillation the proportion of one part of drug to ten parts of product would be better, being sufficiently strong. An extempore formula for preparing this water from the essential oil might be given, though some authors say that the product is not equal to the distilled water.

Aqua Camphoræ.—Dieterich's process is as follows: 0.2 Gm. of camphor, 100 Gm. of hot water; dissolve by shaking, and filter. He points out that water cannot take up more camphor.

Aqua Chlori.—Should only be made extempore.

Aqua Rosæ.—The remarks made under Aqua Aurantii Florum respecting an extempore formula (from the oil) apply also here.

Argenti Nitras Dilutus.—Dieterich's formula coincides with that of Dr. Squibb, but in addition he uses talcum for moulds.

Arnicæ Radix.—In Germany this title is dismissed; here it was introduced in 1880. As its composition is nearly identical with that of the flowers, its introduction was hardly warranted, unless it was for the reason that, being less bulky, it is easier to handle in making pharmaceutical preparations, a statement we find in "Oldberg and Wall."

Ceratum Cantharidis.—Should be given up for Ceratum Extracti Cantharidis.

Ceratum Plumbi Subacetatis.—See formula by Eggenfels (in the U. S. Dispensatory). To prevent yellow color, use a trace of acetic acid (Remington).

Chinoidinum.—Quinine is so cheap to-day that we can well do without chinoidine.

Cinchonina; Cinchoninæ Sulphas.—Do not seem to be used any longer. Perhaps superfluous.

Collodium cum Cantharide.—Dieterich gives a formula for the same with Cantharidin: 0.15 Gm. Cantharidin, 4.0 Gm. Rapeseed Oil, 96 Gm. Collodion.

Decoctum Cetrariæ.—To remove the bitter principle, it is better to use an alkaline menstruum (Remington).

Elaterinum.—This substance was introduced to avoid the dangers connected with elaterium. But, from statements found in the literature, even elaterin appears to vary; sometimes it may be a very powerful substance, again it may be wholly inert, as has been demonstrated by Hiller. Therefore Böhm recommends to begin with one one-hundred-and-twentieth grain, and to increase slowly the dose from one-sixtieth to one-twentieth grain.*

Elixir Aurantii.—If the hot-water process should be selected for the medicated waters, this elixir could easily be made by first dissolving the oil in the water, then adding the alcohol, finally the syrup, and filtering.

Emplastrum Ammoniaci cum Hydrargyro.—If we want the specific properties of mercury, we would prefer the mercury plaster, pure and simple.

Extracta solida, sicca, fluida.—At present, with our advances in science, they do not fill a want as when they were first introduced. Sooner or later they will have to give way to the sole employment of alkaloids and allied bodies. One question arises at present: What will be done with the solid extracts? Will they be retained or replaced by abstracts or powdered extracts as far as practicable? The defects of solid extracts are so well known that we need not add anything further. Hell says (l. c.): "Regarding the consistence of extracts, it has nowhere been possible to break with old habits, etc. Inspissated extracts are truly called an antiquated medication. A more impracticable form for these preparations, subjected to deterioration and desiccation, can hardly exist. To the practitioner it must appear as the most judicious thing if we had only two consistences of extracts, viz., the liquid and the dry form. Only these two forms appear worth while to be recognized in future pharmacopœias. The solid extracts, then, should be dismissed and replaced by powdered extracts (or abstracts) as far as practicable. The present Pharmacopœia has only two powdered extracts, viz., Extractum Colocynthidis and Extractum Colocynthidis Compositum.

Extractum Cannabis Indicæ.—Hell (l. c.) says: To extract the resin fully, and to give the extract a more striking green color, an addition of 10–15 per cent of ether to the alcohol is of great advantage.

Extractum Cubebæ Fluidum.—Menstruum should be alcohol and ether (Hell).

Extractum Physostigmatis.—Böhm says: Unsuitable for an extract. Binz: The alkaloid spoils rapidly.

Guarana.—Do we need it any longer, since its physiological action depends on caffeine, of which it contains as much as 5 per cent? And, by the way, a dose of guarana costs considerably more than an equivalent dose of caffeine.

Hydrargyrum cum Creta.—Remington ("Practice of Pharmacy") says: It should be free from mercurous or mercuric oxide; through exposure to air, old specimens frequently contain both. Also Hager ("Pharmaceut. Praxis") points out, in strong words, these same dangers. Therefore we should dismiss it. Its action is the same as that of calomel.

Infusa.—The official time—two hours—is too long; in some cases we cannot afford to let our customers wait so long. The German Pharmacopœia directs five minutes. Half an hour would be ample.

Infusum Digitalis.—The infusion does not fully represent the drug. It contains principally digitaleïn and some digitalin, but no digitoxin, and for this reason several authors prefer digitalis in substance (Binz, Penzoldt); others, again, are in favor of the infusion as long as we cannot use any of the active principles; while, finally, Binz lays particular stress on the point that heat injures those principles which are soluble in water. Regarding the process, it strikes me that the cinnamon should be left out, or afterwards added in the form of spirit, for the simple reason that the cinnamon obstructs the view.

Linimentum Cantharidis.—Should be dismissed, as it

* The above notes do not comprise the entire paper of the author. Certain portions of it, which are of more direct interest to the Committee of Revision than to the general reader, have been omitted, with the consent of the author.—ED.

* We believe that the inertness of some specimens of elaterin experimented with by a few observers is not due to a variable intrinsic power, but to the accidental or intentional admixture of impurities. We have had much experience with elaterin, and have had no difficulty in getting a pure article, or in obtaining satisfactory results in the usual doses, viz., Tritur. Elaterini (10%) ¼ to ½ grain.—ED. AM. DRUGG.

may blister if not cautiously applied. The Nat. Dispensatory is also strongly against it for the same reason.

Linimentum Plumbi Subacetatis.—Should be freshly made (Dieterich).

Linimentum Saponis.—My formula would be to first dissolve the camphor and the oil in the alcohol, then to add the soap and water, digest at a moderate heat until dissolved, filter, and bring up with water to the required quantity.

Liquor Acidi Arseniosi.—The Nat. Dispensatory is against the same; still it may be serviceable in combination with alkaloidal solutions where Fowler's solution would be objectionable.

Liquor Calcis.—Hell (l. c.) considers the pouring-off of the first quantity of water as extremely superfluous.

Mel Rosæ.—Not absolutely necessary. Hell (l. c.) proposes as a quick process to add 2 drops of oil of rose, triturated with a little sugar, to 1 pound of clarified honey.

Mistura Ferri Composita.—The official directions should be remodelled. As they stand, it is hardly practicable to carry them out to the letter.

Oleum Amygdalæ Amaræ.—Should be dismissed or standardized as to hydrocyanic acid; if not, it is dangerous for internal administration.

Pilulæ.—Should be left to individual prescribing and to the "lex artis" of the pharmacist. We could easily dismiss, without curtailing the physician in the least, the following: Pilulæ Aloes, P. Aloes et Asafœtidæ, P. Aloes et Mastiches, P. Aloes et Myrrhæ, P. Antimonii Compositæ, P. Asafœtidæ, P. Galbani Compositæ; and perhaps also Pilulæ Aloes et Ferri, regarding which I find somewhere the statement: "Frequently ill-borne by the stomach."

Scammonium.—Should be dismissed for two reasons: First, it contains very variable quantities of resin, and its action is therefore not reliable; secondly, its active principle, "jalapin," is nearly identical, chemically and physically, with convolvulin (from jalap).

Spiritus Menthæ Piperitæ.—Why not macerate independently the peppermint with a small quantity of alcohol, for instance, in a graduate, throw this, after twenty-four hours, with the solution of the oil in alcohol, upon the filter, and thus save the annoyance of adhering particles to the sides of the bottle? The same way of procedure might also be followed in the cases of Spiritus Limonis and Spir. Menthæ Viridis.

Strychnina.—Requires 6,667 parts of cold water for solution. Might well be dispensed with.

Syrupi.—The different pharmacopœias use different proportions; a sufficient quantity of sugar is necessary for preservation. Hell holds that the proportion of 65 : 35 or 18 : 10 is the best, and he strongly condemns the proportion 60 : 40 or 15 : 10. The correct proportion we find in the following syrups of the U. S. P.: Syrupus, Syrupus Aurantii Florum, S. Tolutanus, S. Zingiberis; 60 per cent we find in Syrupus Acidi Hydriodici, S. Allii, S. Althææ, S. Aurantii, S. Calcii Lactophosphatis, S. Ferri Bromidi, S. Ferri Iodidi, S. Ferri Quininæ et Strychninæ Phosphatum, S. Limonis, S. Picis Liquidæ, S. Pruni Virginianæ, S. Rhei, S. Rubi Idæi, S. Sarsaparillæ Compositus, S. Scillæ, S. Scillæ Compositus, S. Senegæ, S. Sennæ; 50 per cent in Syrupus Amygdalæ, S. Hypophosphitum, S. Hypophosphitum cum Ferro; 30 per cent only in Syrupus Calcis, and naturally the percentage of sugar is reduced in those syrups which are simply made by admixture—as, for instance, Syrupus Ipecacuanhæ, S. Krameriæ, S. Rhei Aromaticus; also somewhat in Syrupus Acidi Citrici, etc.

Straining of Syrups.—Straining or filtering of syrups is generally prescribed, but in a few instances, for no obvious reasons, omitted—viz.: in the case of Syrupus Allii, S. Althææ, S. Aurantium Florum, S. Picis Liquidæ. Adding sugar to a filtered liquid will nevertheless necessitate filtering or straining, because there are always impurities present in the sugar.

Syrupus Acidi Citrici.—What advantage is it to add the citric acid, dissolved in the water, "gradually"?

Syrupus Althææ.—A process should be devised so that we can keep at least some on hand.

Syrupus Aurantii.—Behringer states (see "Digest") that after expression only 1 to 1½ parts of filtrate are obtained instead of 5 parts. Therefore it seems to me that in a case of this kind (where maceration is practised) we should know how much moisture the drug will absorb and finally retain, and then add this inevitable loss at once to the menstruum, so that after filtration or expression we just have the required quantity without being compelled to add more of the menstruum which has never been in contact with the drug. Hence the above filtrate of 1½ parts + 3½ parts of alcohol must be inferior to one where the original amount of menstruum has been large enough to just produce, after expression, 5 parts of filtrate.

Syrupus Pruni Virginianæ.—In the "Digest" we find the remark taken from the U. S. Dispensatory: "15–20 per cent of glycerin answers the purpose better than 5 per cent." I do not use any glycerin at all, and yet my syrup keeps remarkably well. The glycerin craze is a nuisance; instead of being on the wane, it appears to be on the increase. Under Syrupus Rhei Aromaticus it is even claimed that replacing half the syrup with glycerin would be an improvement. The originators of such formulæ seemingly forget that glycerin is not an indifferent substance. Is a syrup with half its weight of glycerin still a syrup? I make Syrupus Rhei Aromaticus with a tincture made by myself, and not with a fluid extract made by some one else, and it is perfectly transparent. Finally, I would like to see better and shorter formulæ adopted for the following syrups: Syrupus Rhei, S. Sarsaparillæ Comp., S. Scillæ, S. Scillæ Comp., S. Sennæ, S. Tolutanus, S. Zingiberis.

Tincturæ.—The U. S. Ph. of 1870 contained 46 fluid extracts; at the revision in 1880, 2 were dismissed—viz., Extractum Erigerontis Fluidum and Ext. Spigeliæ et Sennæ Fluidum—and 35 were added, making a total of 79 official fluid extracts at the present time. The tinctures of the old Pharmacopœia numbered 57; 7 of these were dismissed and 22 new ones added, making a total of 72 tinctures, not counting Tincturæ Herbarum Recentium. Notwithstanding this apparent increase, the following comparison will show that tinctures are gradually losing ground. As is well known, tinctures are much older preparations than fluid extracts, but we find—in accord with the times—very seldom to-day a tincture introduced with a new fluid extract. Of the 35 new fluid extracts there are only 2 which have corresponding tinctures, viz.: Tinctura Arnicæ Radicis and Tinctura Chiratæ. Four tinctures, corresponding to fluid extracts previously officinal, were added, viz.: Tinctura Cimicifugæ, Gelsemii, Hydrastis, Matico—an addition hardly warranted. The balance of newly added tinctures—16—have no corresponding fluid extracts in the Pharmacopœia. In two cases this would be impossible, namely, Tinctura Ferri Acetatis and Tinctura Saponis Viridis. In other cases again we might ask, Why was not a fluid extract introduced alongside of the tincture—*f. i.*, Tinctura Bryoniæ, T. Physostigmatis, etc.? Of previously officinal tinctures 32 have no corresponding fluid extracts (in some cases this would be impossible), viz.: Tinctura Aloes, Aloes et Myrrhæ, Arnicæ Florum, Asafœtidæ, Aurantii Dulcis, Belladonnæ, Benzoini, Benzoini Composita, Cantharidis, Cardamomi, Cardamomi Composita, Catechu Composita, Cinchonæ Composita, Cinnamomi, Ferri Chloridi, Gallæ, Gentianæ Composita, Guaiaci, Guaiaci Ammoniata, Humuli, Iodi, Kino, Lavandulæ Composita, Moschi, Myrrhæ, Opii, Opii Camphorata, Opii Deodorata, Rhei, Tolutana, Valerianæ Ammoniata, Vanillæ. On the whole there are 79 fluid extracts with 28 corresponding tinctures. Some or most of the latter could be dispensed with. Where the dose of the fluid extract is safe and large enough to be easily divided, we should give preference to the fluid extract and dismiss the corresponding tincture. As a dose which can be easily and accurately divided, we would take a fluid extract with a dose of from 15 ♏ for an adult; but to follow this plan would exclude quite a number of fluid extracts, and we find that we have to go as low as 5 ♏. But where the dose of the fluid extract is only 1 to 2 ♏ for an adult, we would prefer to retain a corresponding tincture. Thus, comparing the doses of these 28 tinctures with the respective fluid extracts, we find that, as far as the doses are concerned, we can dispense with tinctures in the case of the drugs of which we have the following officinal fluid extracts: [See table on opposite page.]

We have only left the following tinctures, viz.: Tinctura Aconiti, Cannabis Indicæ, Capsici, Digitalis, Stramonii, Veratri Viridis. The doses of their fluid extracts are:

		Nat. Disp.	U. S. Disp.
Extractum Aconiti	Fl....	½–1 ♏ (to begin with)	same.
" Cannabis Indicæ	"	½–1 ♏ "	same.
" Capsici	"	1–2 ♏	½–1 ♏
" Digitalis	"	1–2 gtt.	1–2 ♏
" Stramonii	"	1–2 ♏ (to begin with)	1–2 ♏
" Veratri Viridis	"	1–3 ♏	1–2 ♏

It would, however, be advisable to retain for domestic trade a few of these tinctures, viz.: Tinctura Cinchonæ, Cubebæ (?), Lobeliæ (?), Valerianæ, Zingiberis.

[The author further adduces special reasons, based on therapeutic or other grounds, for dismissing or retaining particular tinctures; these are here omitted.]

Tinctura Aloes.—The U. S. Dispensatory speaks of its external uses. Böhm is partly in its favor as a stomachic; against the same, Binz, Penzoldt. Process: Should be made extempore by simply triturating the aloes and glycyrrhiza with the required amount of alcohol and water.

Tinctura Aloes et Myrrhæ.—Not needed. Process: Could be quickly made in the same manner as the preceding tincture.

Tinctura Benzoini.—Process: Rub the benzoin with the alcohol, and filter.

Tinctura Cinchonæ Composita.—Formula: Why not

leave out the Serpentaria? I would prefer the German formula with cinchona, orange peel, gentian, and cinnamon.

Tinctura Croci.—For coloring purposes something more tasteless ought to be substituted.

Tinctura Digitalis.—Does the tincture contain digitoxin?

Tinctura Gallæ.—It would be advisable to introduce a tincture or solution of tannic acid instead.

Tinctura Lavandulæ Composita.—Called by some authors an agreeable adjuvant, a fact which I would not confirm. Either the oil should be omitted and the tincture be called Tinct. Cinnamomi Comp. or Tinctura Cardamomi Comp., or Tinctura Cinnamomi be used instead.

Tinctura Myrrhæ.—Process: Could be made in the same manner as Tinctura Aloes.

Tinctura Opii Camphorata.—It may be of interest to cite Schmiedeberg's sentence: "Superfluous, irrational preparation. This tincture is a curiosity." Called also superfluous by Penzoldt. Still it may be advantageous to possess a tincture of opium with camphor, and thus a great deal of damage which would be done is averted. No doubt the benzoic acid figures here for the sake of a stimulant expectorant, but Binz says: "The small quantity of benzoic acid probably plays no part in the usual doses." If we wanted, then, to combine expectorant properties with paregoric, the amount of benzoic acid must be considerably increased. Process: Should the camphor be dissolved first or some be left after maceration?

	Doses taken from:	
	Nat. Dispensatory.	U. S. Dispensatory.
Extractum Arnicæ Rad. Fluidum....	10–30 ♏	5–10 ♏
" Aurantii Amari "	1 ʒ	15–30 ♏
" Calumbæ "	no dose	15–30 ♏
" Chiratæ "	ab. 20 ♏	30 ♏
" Cimicifugæ "	30 ♏–1 ʒ	30 ♏–1 ʒ
" Cinchonæ " ...	as a tonic ½ ʒ	1 ʒ (apparently).
" Colchici Sem. "	2–8 ♏	2–8 ♏
" Conii "	2–6 ♏	5 ♏ (to begin with).
" Cubebæ "	10–30 ♏	10–40 ♏
" Gelsemii "	5–10 ♏	2–3 ♏
" Hydrastis " ...	1 ʒ	1–2 ʒ
" Hyoscyami "	5–10 ♏	5 ♏ (to commence with).
" Krameriæ "	½ ʒ	10 ♏–1 ʒ
" Lobeliæ "	Emetic 10–20 ♏ / Expect. 1–5 ♏	same.
" Matico "	½–2 ʒ	½–1 ʒ
" Nucis Vomicæ "	1–5 ♏ or more	3–5 ♏
" Quassiæ "	5–20 ♏	5–10 ♏
" Sanguinariæ "	Emetic 10–60 ♏ / Nauseant 3–5 ♏	3–5 ♏
" Scillæ " ...	3 ♏ or more	2–3 ♏ (as an expectorant).
" Serpentariæ " ...	½ ʒ	20–30 ♏
" Valerianæ "	1 ʒ	ab. 1 ʒ
" Zingiberis "	10 ♏ or more	10–20 ♏

Tinctura Rhei Aromatica and *Tinctura Rhei Dulcis.*—The title implies that these tinctures are the same as Tinct. Rhei, with the exception that the one is aromatic and the other sweet, but, strictly speaking, Tinct. Rhei is already an aromatic tincture through the Cardamom. Tinct. Rhei contains 12 per cent, Tinct. Rhei Aromatica 20 per cent, and Tinct. Rhei Dulcis only 8 per cent of rhubarb. Why not make the percentage of rhubarb a uniform 20 per cent? In this instance we would probably have to raise the amount of aromatics, etc., accordingly.

General Remarks on Tinctures.—Finally we query: Would it not be fully appropriate, if we must have tinctures, to make some from their active principles, *f.i.*, Tinct. Physostigmatis, Nucis Vomicæ, etc.? The Pharmacopœia Belgica makes the latter from strychnine. We also wish to direct attention to the following irregularities in fineness of powder. The Pharmacopœia directs for

Tinct. Aloes, aloes in moderately fine powder.
Tinct. Benzoini Comp., aloes in coarse powder.
Tinct. Benzoini, benzoin in moderately coarse powder.
Tinct. Benzoini Comp., benzoin in coarse powder.
Tinct. Cardamomi, cardamom in No. 30 powder.
Tinct. Cardamomi Comp., cardamom in No. 40 powder.
Tinctura Cinchonæ Comp., bitter orange peel in No. 60 powder.
Tinct. Gentianæ Comp., bitter orange peel in No. 40 powder.

Compound tinctures should represent the same proportion of the base as the simple tinctures; but we find in Tinct. Benzoini 20 parts of benzoin; Tinct. Benzoini Comp., 12 parts only; Tinct. Cardamomi, 15 parts of cardamom; Tinct. Cardamomi Comp., 20 parts of cardamom; Tinct. Cinchonæ, 20 parts of yellow cinchona; Tinct. Cinchonæ Comp., 10 parts of red cinchona.

Unguenta.—Regarding ointment bases I wish to say this: Remington recommends to us as a base for the majority of ointments petrolatum instead of lard or benzoinated lard. But petrolatum has its drawbacks, and so has lanolin, which some people wish to use exclusively. The best solution out of the dilemma might be, if the Pharmacopœia would allow several ointment bases for the several emergencies or the different seasons.

Unguentum Acidi Carbolici.—Should be left to individual prescribing.

Vina.—The Pharmacopœia enumerates several wines from drugs of which we also have a fluid extract or tincture made with a different (stronger and more appropriate) menstruum. Can the resulting products, therefore, contain all of the active substances which we find in the corresponding fluid extracts or tinctures? It appears not. It seems, therefore, that even in the doses due allowance is made for this fact, even if done unconsciously. This is most strikingly shown in the case of Vinum Aloes. Vinum aloes (6 per cent aloes), dose one-half fl. oz.; Tinctura Aloes (10 per cent aloes), laxative, dose 15–45 ♏; purgative, 1½ fl. ʒ. Medicinal wines, even if they are inferior in medicinal qualities, may have one advantage, and that is better taste, but still we may well get along without most of them.

I now wish to point out those substances where, instead or besides the present preparations or forms, we could introduce one or more active principles, as the times are nearly ripe for mathematical medication. These latter substances have one great drawback—they are generally high-priced; but as most of them are only used in small doses, their cost after all is only a trifle, but still enough of these are left which for general practice are too dear. If the pharmacist's bill is then high, he gets the blame, and is upbraided for his supposed exorbitant and outrageous charges. The drugs referred to are Aloes, Brayera, Cantharis, Colchicum, Colocynthis, Conium, [Creasotum], Dulcamara, Ergota [?], Erythroxylon, Euonymus, Frangula (?), Gelsemium, Gentiana, Granatum, Hydrastis, Iris, Jalapa, Leptandra, Lobelia, Physostigma, Pilocarpus, Podophyllum, Quassia, Sanguinaria, Senna, Scoparius, Uva Ursi. To some of these I have to add a few remarks.

Conium.—It was certainly a great step forward in the right direction to dismiss the leaves and to introduce the fruit. But then the fruit is not exactly what we need. Coniine (or, better, one of its salts, the hydrochlorate or hydrobromate) ably fills the indications for this drug. Bartholow says: "The preparations of conium are very uncertain in strength. It is pretty well established that the extracts are nearly if not quite inert. The best preparations are the fluid extract and the alkaloid." Further on he says: "The chlorhydrate resp. bromhydrate of coniine are greatly to be preferred, not only to the pure alkaloid, but to any of the preparations of conium." Also Hugo Schulz (in Eulenberg's "Encyclopædia") is strongly in favor of the salts of coniine, and it is to be hoped that the next Committee of Revision will adopt at least the hydrobromate of coniine, although the use of conium is greatly restricted in our times. This is owing, according to Hugo Schulz, perhaps most to the inactivity of the customary preparations.

Creasotum.—Guaiacol, its most important constituent (60–90 per cent), which has a definite composition, has been tried and is now used by Sahli, Fraentzel, Schüller, and others, and should be made officinal.

Eucalyptus.—From the literature it appears that the oil could fully and ably take the place of the crude drug and its preparations. Perhaps then it would be well to introduce a solution of oil in alcohol for dispensing purposes.

Physostigma, Pilocarpus.—Should be dismissed. Their principal active substances, physostigmine and pilocarpine, should only be used.

Uva Ursi.—Arbutin is thought by some authors to represent the drug fully.

Finally, I would like to see the following improvements made in the Pharmacopœia: To state or to describe the color of tinctures, fluid extracts [?], perhaps also of other preparations; to state, in every case where a formula is given for a certain substance, the expected or required yield—for instance, in iron preparations and the like—in solid extracts, etc.; to name in the formulæ directing percolation the exact quantity of menstruum necessary for a required quantity of drug (see Dieterich's formulæ for fluid extracts); to give, if possible, a table of drops in each fluidrachm of pharmacopœial liquids, so that, when we get a prescription with a substance only specified in drops instead of minims, we can readily find the equivalent of the drops in minims, and save time and trouble. And, last of all, the Pharmacopœia should give full directions regarding the preservation of its preparations, etc., as far as possible. In quite a number of cases the Pharmacopœia already imparts such knowledge, but it could be widely extended at this date.

THE PERFUME OF ROSES.

At the outset, it is not the *perfume* but the *perfumes* of roses of which we should speak; for a slight examination of even a small collection of rose bushes will show that it is difficult to find two varieties of roses possessed of the same odor. Even in two roses of the same species, one partly open and the other completely opened, one can distinguish different shades of the odors which they furnish. Or, still better, the same rose gives different odors at different times of the day. Thus, in the morning, before the dew is dissipated from the night rose, it does not exhale the same odor as at noontide when its petals wither and its stem droops. There are, if one pleases so to consider it, shades of the same fundamental odor at different times, and it is evident that it may be necessary, at times, to give close attention and possess a cultivated sense of smell to distinguish these differences. Certainly no odor justifies in greater degree the use of the term *subtle*. On the other hand, by the side of roses gifted with a classic perfume, well recognized but with various shades—roses which have the *rose odor*—there are many which exhale quite a different odor. There is one with the odor of the violet (*Banksia alba*); the lily of the valley (*Rosa Ripartii*); musk (*Rose Salet*—a hybrid of the moss rose); mignonette (*Rosa canina*); hyacinth (single yellow rose—variety of filbert rose); carnation (*R. moschata*); raspberry (*Gloire de Dijon*—tea rose); apricot (*R. bracteata*); pineapple (*Rose Desprez*); rennet apple, etc. One has the odor of the bedbug (*Rosa lutea, Rosa platyacantha, Rosa Beygeriana*). Moreover, there are those which have no smell, and these are numerous and not the least beautiful (Persian yellow, Captain Christy, etc.). Does there exist a relation between these various odors and the specific characters of the flowers? That is to say, does a study of the perfume aid the naturalist in the classification of roses? In some cases it does; in many more it does not.

We will not undertake, at this time, to enter into the details of this question, but refer the reader to "Les produits odorants des Rosiers," by Dr. Blondel; Paris: O. Doin, 1889, pp. 163, 8vo. The determination of the perfume of a rose is, more often than otherwise, not so easy as it may seem. Everybody knows that in a rose the petals evolve the perfume, but what is habitually ignored is that the green portions—the calyx and pedicle of the flower—have frequently their particular odor, which enters into combination with that of the petals in the mixture of perfumes submitted to our sense. It may happen that the petals do not smell at all, and the calyx alone yields all the odor. This is more frequently the case than one may suppose in the vegetable kingdom. Take, for example, the flower of *Pelargonium zonale*, which, under the improper name of red geranium, forms the borders of many gardens. This flower exhales an odor of the bedbug, or urinous in character. Now, with the aid of tweezers, gently detach its five petals one by one, and place them upon a sheet of inodorous paper or marble. Gather thus as many petals as you please, and you may be surprised to find that they give off no odor. Now examine what remains of the flower deprived of corolla, and it will be perceived that the calyx and pedicle are the sources of the odor. On closer observation, one may distinguish numerous little essence glands which cover these portions like a light down. It is to similar glands that the perfume of the calyx of the rose is due—when there *is* a perfume. The same is true in the case of the leaves of certain rose bushes when they are bruised. It may be remarked that if in a species the flowers and the leaves are both odoriferous the odors produced by each are plainly distinguishable. The flowers of the hundred-leaved rose possess the characteristic odor which is entitled "the odor of roses," but its leaves when bruised emit a peppery odor quite distinctive and different from the other.

The most common species having odorous leaves are those in which the flowers are inodorous. This is the case with *R. rubiginosa*, the leaves of which possess an agreeable odor of the rennet apple, which is perceptible at a distance, under certain conditions; *R. lutea*, whose leaves have an odor of lemon; *R. mollis, R. pomifera, R. tomentosa;* and, generally speaking, in all of the groups of *Tomentosæ* the leaves give off, when bruised between the fingers, a disagreeable odor of myrrh and rosin.

Without going into a consideration of the details of the glandular organs of the leaf of the rose bush, it may be remarked that each of these delicate glands is composed of a support of more or less length, and a ball-like head which is the active portion. The oleo-resin which they secrete is accumulated about the top of the sphere, raising the envelope of cellulose which covers the gland, and forming a rounded drop which, seen in a hemispherical section of the secreting cells, depresses the latter. Upon the least pressure being applied, the pellicle of cellulose is ruptured, and the essence escapes and communicates its odor to whatever it touches.

The rose which serves best for this study of the glandular organs is the moss rose. However easy it may be to study the glandular apparatus of the green portions with the naked eye, it is quite impossible to do so in the case of the petals. It is evident, however, that such a secretion of odorous matter exists, as shown by the fact that it can be separated by distillation and yield what is known as the essence [or attar] of roses. However closely we examine the petal, we fail to discover the trace of a secretory organ. It is true that the upper surface of the petal is covered closely with minute conical papillæ, the purpose of which is, however, quite different. By virtue of the air retained between them, they give to the petals, especially those of a dark color, their velvety appearance. It is only by making sections that this problem can be settled. A fine section made with a razor, at right angles to the surface of the petal, as shown in Fig. 1, shows the petal to be composed of two superficial epidermis layers enclosing a loose-textured parenchyma. The upper layer shows the cells with papillæ above referred to. But there is no trace

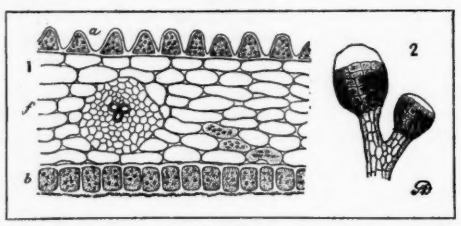


Fig. 1.—Section of a rose petal, treated with a 1 : 200 solution of osmic acid and seen with a microscope. *a*, Upper epidermis with papillæ. *b*, Lower epidermis with quadrangular cells. *f*, Parenchyma and fibro-vascular bundles.
Fig. 2.—Leaf glands.

of secreting organs, and they cannot be found excepting by a resort to the following artifice: If the section is placed for several seconds (say fifteen) in a watery solution of osmic acid, 1 : 200, and then replaced in the microscope, one may observe in the cells of both epidermal layers the formation of large, bluish-black masses which are nothing else than a precipitate of metallic osmium, caused by contact with the essential oil. It is, therefore, the entire surface of the petal which secretes the odor (Figs. 1 and 2, *a* and *b*).

By means of other reactions it is shown that essential oil is in combination with a tannin and a fixed fatty matter difficult of isolation. It is probable that the volatile oil is formed from some decomposition of the tannin.

The cultivation of rose bushes for the production of the essential oil is, at the present day, chiefly in France and Bulgaria, but the last is alone entitled to the sobriquet of the *Land of Roses*, so long applied to the valley of Kashmere, in Persia. There once was a valley of roses in Kashmere, or rather at Shiraz, and Kaempfer, who visited it in 1684, gave a very curious description of it in his "Amœnitates" (ii., 373). But things have changed since that time, and the valley of Kashmere now produces only the oil of Palma-rosa—a sort of false rose oil. The magnificent gardens of the shah, where, under poetical circumstances, the attar of roses was first discovered in 1612, contain only a few giant rose bushes, preserved as curiosities, an example of which, as reported by Pissard, flowers to-day at Argenteuil in the garden of Mr. Godefroy-Lebœuf. One which Olivier saw at Teheran, about the commencement of the century, had a height of thirty feet. This is all that remains of roses in the "Land of Roses," and, by a curious reversal of things, the shah sends to Europe for the rose bushes for his own gardens.

At the foot of the Balkan mountains, in the ancient Turkish province of Eastern Roumelia, but belonging to Bulgaria since the revolution of 1885, is situated the most important industrial culture of roses, of which the two principal centres are Karlova and, above all, Kézanlik (see the map, Fig. 3). The plantations cover the two sides of each valley, but those upon the high slopes of the Eastern Balkans are by far the more important and in better condition than those which are opposite at Sredna-Gora. The

southern side of this latter range still bears several plantations, but only comparatively few. The several cultivations on the northern side of the Balkans have no industrial importance.

The two extreme points of the Valley of Roses are Koprivchutza on the westward and Tvarditza towards the east. The valley of the Strema is comprised in the district of Karlova (the ancient Turkish canton Giopça). That of Toundja is situated in the districts of Kézanlik and Nova-Zagora (Turkish Ienė-Sagra). The districts situated on the southern slopes of Sredna-Gora are Nova-Selo (formerly Turkish canton of Kojim-Tepe), Brezovo (Karadscha-Dagh), Tchirpan, Stara-Zagora (Eski-Sagra). Far to the southward, at the foot of the Rhodopes (Despoto-Dagh), between these mountains and the Maritza, has lately been established a small culture, as yet without great importance, at Bradzicova (district of Pechtíza).

The present cultures of roses in Bulgaria have an appearance shown in Fig. 4. They are large sandy fields, in which the bushes are arranged in long rows and attain to the height of a man. The rows are from 1½ to 2 meters apart. Three species are raised; the first and only one really cultivated, and which represents 90 per cent of the roses, is a branching variety of *R. damascæna*, and the red rose of the Bulgarian peasantry. Its odor is not very marked, but exquisite. The second, known as the White rose, is, according to specimens which we have handled, a *R. alba*. Very few of the latter are cultivated, its flowers, owing to their faint odor, being but little esteemed by distillers. It flowers fifteen days later than the other, and it is never distilled alone, and is only planted on the margins of the plantations and at the ends of the rows to mark their limits and to offer to the depredations of passers only valueless flowers. The third variety is a dark red rose, known locally as the Rose of Constantinople; we have never obtained a specimen of the flower in good condition, but its leaf warrants its classification with the *Gallicanes*, to which group belongs *R. damascæna*. Its presence in the cultures is quite accidental.

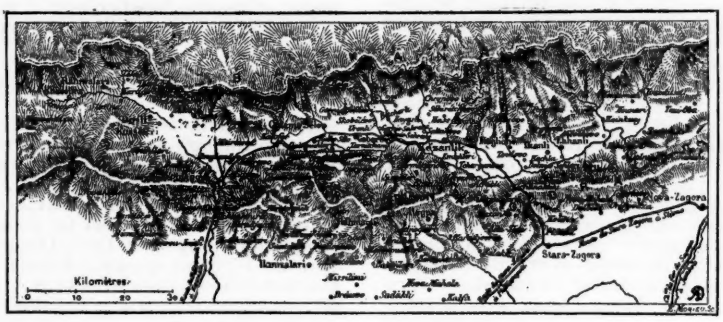


FIG. 3.—Map of the Balkan region devoted to rose culture.

The cultivation of roses is complicated and requires great care: pruning, frequent weeding and tilling between the rows, piling the earth about the foot of the shrubs at the commencement of winter to prevent the disastrous effects of frost, etc. Frost is really the greatest enemy of the rose bush, but not the only one. One of the most singular is a worm, or rather a larva, called *tchervé*, which penetrates the bark at times of great heat, and which excavates an annular passage around the branch, distinguishable from without by a slight enlargement. Upon handling, the branch breaks at this point as if it were a rod of glass. The flowering takes place from the 20th of May to the 20th of June.

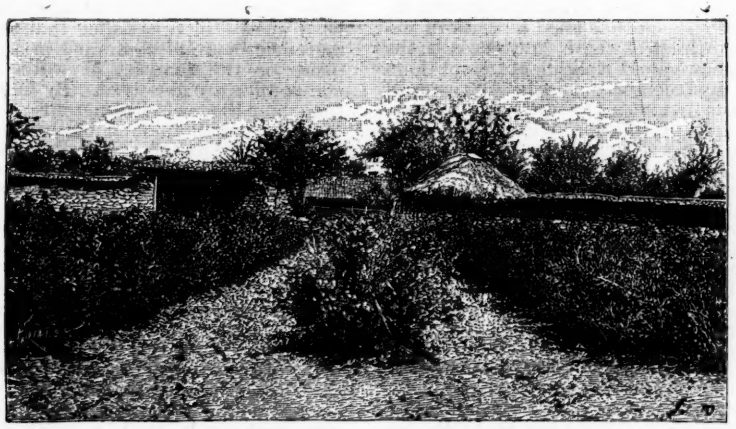


FIG. 4.—A rose field at Kézanlik (after a photograph).

In France, about Cannes and Nice, where roses are cultivated, the rows are from 1 to 1¼ meters apart and situated on the sides of valleys exposed to the sun. The culture is of limited extent, and is conducted by the peasants, who are proprietors, and who dispose of the flowers at the large distilleries established in the adjoining town. The variety cultivated there is the hundred-leaved rose (*R. centifolia*), which flowers from the 20th of April to the 20th of May—a month earlier than in Bulgaria. Another variety belonging to the group of the tea rose, the Rose *safrano*, is raised during the winter, but gives flowers but slightly odorous and an oil of inferior quality. The distillers rarely receive them, the greater portion going to Parisian florists.

At Provins, during the middle ages, the *R. Gallica* (Rose de Provins) was cultivated in great abundance for the preparation of rose sachets, rose water, and, above all, for the famous confection of roses and honey. There exist now in Provins hardly a hundred feet of rose bushes, and these in a particular garden. This industry, once celebrated, is now nearly extinct. The petals termed "Provins," still prescribed by the Codex, and still in use in pharmacy, are derived from the environs of Paris and consist of red roses of all sorts. The Department of Var furnishes for this purpose a variety of tea rose, known as *Cramosi supérieur*.—Abstract from paper in *La Nature* by DR. R. BLONDEL.

Coloring Matter from Chlorophyll.

A. HANSEN (*Bot. Centralbl.* 38, 632) prepares the yellow and the green constituents of chlorophyll in what he believes to be a pure condition by the following process: Some leaves of grass are boiled in water from 15 to 30 minutes, then washed many times with water and dried in the dark. The dry matter is extracted with boiling alcohol, and the solution saponified by boiling for three hours with a slight excess of aqueous soda; a current of carbonic anhydride is then passed through the solution, which is afterwards evaporated to dryness on the water-bath. Ether extracts from this soap the yellow coloring matter only, which is purified by evaporating down and crystallizing from a mixture of equal parts of ether and light petroleum. The soap, after extraction with ether, is extracted with a mixture of alcohol and ether, which dissolves only traces of the combination of the green coloring matter with soda. On adding another quantity of alcohol-ether and also phosphoric acid, the green matter is liberated and passes at once into solution, from which it is obtained by evaporation in the form of a brilliant, fragile, greenish-black solid, insoluble in water, benzene, and carbon bisulphide, sparingly soluble in pure ether, very soluble in alcohol with strong red fluorescence. The crystals of yellow coloring matter form orange-red plates insoluble in water, soluble in alcohol, ether, chloroform, and benzene to a deep-yellow color, and in carbon bisulphide to a brick red. These crystals are transformed in the light into cholesterin. The author considers this yellow substance to be identical with the yellow coloring matter of flowers and fruits in general, including that of the carrot.—*J. Chem. Soc.*

Exalgine.—PROF. T. FRASER, in a recent clinical lecture, made some comments based upon his use of exalgine which may supplement what has already been published. Methyl-acetanilide, or exalgine ($C_9H_{11}NO$), occurs in colorless, needle-shaped crystals, which have a faintly aromatic odor and slightly pungent taste. It is nearly insoluble in water, but is freely soluble in rectified spirits, and even in dilute alcohol. Professor Fraser finds that from 16 to 20 grains may be dissolved in one-half drachm of rectified spirit, and that this solution may be diluted with 3 or 4 ounces of water and still remain perfectly clear. As a solution so made, and containing one-half grain or 1 grain in a teaspoonful, has but little taste, it is generally used without the addition of any flavoring agent. Professor Fraser has used the remedy in doses of one-half grain, frequently increased to 1, 2, 3, and 4 grains, but seldom exceeding 14 grains per day, this quantity not inducing any bad results. The notes of the cases of neuralgia, etc., in which exalgine was used, show that in about ten minutes after the dose was administered relief was obtained. It was attempted to relieve pains of various kinds with the drug, but, as was to be expected, it failed in some instances, succeeding, however, in a wonderful manner in facial and other neuralgias, sciatica, toothache, cardiac angina, and even in one case of pleurisy. The doses which are most to be relied on are one-half and 1 grain.—*Chem. and Drugg.*, from the *Br. Med. Jour.*

Notes on the Alkaloids.

AT a recent meeting of the Society of Chemical Industry held at Edinburgh, Mr. D. B. Dott presented the following paper, which we take from the *Journal* of the Society:

There exists considerable diversity of definition of the term alkaloid, which is indeed regarded by Professor Armstrong as indefinable. The author objects to a definition which makes the term apply only to compounds of a markedly poisonous character or to compounds of a vegetable origin, considering that an alkaloid should be regarded as such on account of its constitution and chemical properties, and without reference to its source or physiological action. It is maintained that an alkaloid is any alkali-like or basic compound, whether of the NH_3 or NH_4 type, and that the term is also applicable to the basic compounds in which phosphorus or arsenic takes the place of nitrogen. The views enunciated by Professor Armstrong (*Jour. Chem. Soc. Ind.*, 1888) regarding the properties of nitrogen are criticised, the author contending that there is little evidence to show that nitrogen is a substance of great activity in the elementary or atomic as distinguished from the molecular state. A study of the alkaloids does not obviously confirm the theory, as many of these bodies, such as cinchonine and ecgonine, are physiologically very feeble substances, while on the other hand glucosides, like digitalin and strophanthin, are powerfully toxic. Whence it is hardly probable that the toxicity of the poisonous alkaloids is in any direct sense due to their nitrogen.

The remainder of the paper is occupied by some general remarks on the alkaloids and their salts. Although all alkaloids are probably potentially crystalline, some few have obstinately resisted all attempts to crystallize them. Among these is berberine. The author was the first to prepare a crystalline salt of that base (*Pharm. Jour.*, 1880), and was enabled to confirm the accuracy of the formula $C_{19}H_{21}NO_{31}$ ascribed by Flückiger from an analysis of the amorphous base. The hydrochloride crystallizes in trimetric prisms, which is the form nearly always assumed by alkaloidal muriates. Whence it is probable that many double salts of alkaloids could be prepared, although the double muriate of morphine and codeine is almost the only one which is prepared in practice. The custom (common in this country) of describing salts of the formula BHCl as hydrochlorates is condemned as erroneous, the expression more probably applying to the so-called chlorates, $B.HClO_3$, hydrochloride being the more correct designation of salts of the former formula. Reference is then made to a question of some interest which has received very little attention. It is well known that while some of the alkaloids are strong bases, whose solutions turn red litmus blue, other members of the class do not affect litmus, and only form well-defined salts with the stronger acids. In some cases the combination of acid and base is so feeble that decomposition is caused by water.

It has not been determined which of all the known alkaloids is the strongest. The author tried a series of experiments to determine which of the opium bases is the strongest, by treating equivalent weights of two of them with an equivalent of hydrochloric acid in presence of water; and also, in some instances, by digesting a molecular weight of one salt in solution with a molecular weight of another alkaloid. Conclusive results are not always obtained. Codeine is the strongest and narcotine or narceine the weakest. Though doubtless the point is principally determined by the relation which the nitrogen bears to other groups in the molecule, it appears that the solubility is also a factor in the case. For instance, codeine is far more soluble, both in water and in alcohol, than is morphine, so that the former is in a more favorable position for combining with the acid. In the case of an alkaloid which forms two or more hydrochlorides, there cannot, as a rule, be any difficulty in determining which of the salts is normal. In the case of the cinchona alkaloids, however, which contain two nitrogen atoms of different value in the molecule, and form two platinic salts, the question is not so simple, hence in some books the ordinary quinine sulphate, Q_2,H_2SO_4, is described as the basic, in others as the normal salt. It is a matter of old observation that several of the organic bases when precipitated by caustic alkali dissolve in excess, though it was not till a few years ago that Chastaing proved that this is due to the formation of definite compounds of the alkali and alkaloid. He regarded morphine as resembling phenol in so far as it contains a hydroxyl atom which readily allows its hydrogen to be replaced. This having been shown to be the case in regard to morphine, it became interesting to know whether other alkaloids which are readily soluble in alkalies contain a similar hydroxyl group. With this view the author and Stockman* experimented on narceine, but did not succeed in replacing a hydrogen by a methyl or ethyl group, by the method which easily effects the desired change on morphine.

In conclusion, reference is made to the alkaloids of the *ammonium* as distinguished from the *ammonia* type, it being considered that the former class have not received all the attention they deserve. This probably arises from the fact that they have a tendency towards a similarity of physiological action. The author approves of the names used by Crum Brown and Fraser (Trans. Roy. Soc. Edin., xxv., 693) as "methylmorphium iodide" and "ethylstrychnium chloride." The name "morphine methiodide" suggests a compound quite analogous to morphine hydriodide, which is misleading, as the former body does not yield morphine by any method of treatment, but always other products, and possesses also a physiological action quite distinct from that of the morphine salts. When morphine or codeine is heated in a sealed tube with hydrochloric acid, apomorphine is produced; but when the so-called "morphine ethochloride" is similarly treated, no apomorphine appears (unpublished experiments of the author), which is additional proof of the essential dissimilarity of the two classes of compounds. It seems not unlikely that these ammonium-like alkaloids may become chiefly useful as media for the preparation of new alkaloids, for as methylcodeium hydroxide yields, by heating with an alkali, the potent compound methocodeine (Grimaux, *Comptes Rendus*, xcii.), we may anticipate that an analogous action will occur in other instances.

* Unpublished experiments.

Note on Lister's Cyanide of Zinc and Mercury.

As a supplement to several articles previously published by us on the new antiseptic proposed by Lister (see especially our last number, page 48), we print here a portion of an elaborate paper by Prof. W. R. Dunstan, of the Research Laboratory of the Pharmaceutical Society of Great Britain. His object was to ascertain whether the new compound hit upon by Prof. Lister was a true double salt or not. Without quoting details, we may state that this was not found to be the case, but that under certain conditions cyanide of zinc is capable of obstinately retaining cyanide of mercury. We now quote the author's words (after *Pharm. Journ.*, February 1st):

. . . Of the four hypotheses as to the manner in which the mercury cyanide is retained in the new antiseptic, only one has stood the test of experimental verification—namely, that which supposes that the mercury cyanide is mechanically retained by the zinc cyanide. With this hypothesis all the facts perfectly accord.

Sir Joseph Lister has stated that the value of this intimate association of mercury cyanide with zinc cyanide as an antiseptic is largely dependent on its very slight solubility. It is therefore useless to expect that any good result would ensue from the employment of any soluble compound containing mercury, zinc, and cyanogen, as, for example, the remarkable compounds containing the mercury and zinc cyanides, combined with mercuric chloride, which have been lately described by Varet. For the present, at any rate, it seems probable that the substance which forms the subject of this communication will be largely employed as a surgical antiseptic.

It is, therefore, important that manufacturers should know how to prepare it of uniform composition. It has been shown in this paper that the amount of occluded mercuric cyanide contained in the material mainly depends on the quantity of water in which the reacting compounds are dissolved. By increasing the quantity of the water the occluded mercuric cyanide will be reduced to a very small amount, but by diminishing the quantity of the water as far as possible the amount of occluded mercuric cyanide may be raised to about 36 per cent; it does not appear to be possible to cause zinc cyanide to occlude a very much larger quantity of mercuric cyanide than this. The manufacturer will therefore have to employ as much water as will lead to the production of a substance which answers best as an antiseptic. So far Sir Joseph Lister has employed a material containing about 15 per cent of the mercuric salt, but he informs me that the presence of a larger proportion of occluded mercuric cyanide would probably enhance the antiseptic value of the substance. If this should be found to be the case, then the quantity of water used to dissolve the reacting compounds must be reduced to a minimum. It may, perhaps, be useful to mention the details of the process that has been found to answer best. Mercuric cyanide, finely powdered, is completely dissolved in a warm concentrated solution of potassium cyanide* and precipitated, when cold (12° to 15° C.), with a cold saturated solution of zinc sulphate.† The ingredients should be used in the proportions indicated by the equations:

$$Hg(CN)_2 + 2KCN = HgK_2(CN)_4;$$
$$HgK_2(CN)_4 + ZnSO_4 = HgZn(CN)_4 + K_2SO_4.$$

The potassium cyanide should contain at least 95 per cent of KCN, but even then a small quantity of a zinc hydroxy-compound will be formed, but its presence to this small extent does not appear to be deleterious. The precipitate is washed free from mercuric salt with cold water, and dried, preferably over caustic soda or on porous tiles. If the substance be dried at 100° C., from 2 to 3 per cent of the mercuric cyanide will be rendered

* In order to prevent the crystallization of the mercury salt from the cold solution, 25 C.c. of water must be used for every 10 grams of mercuric cyanide employed.

† If the solutions are mixed while hot, more mercuric cyanide will be dissolved and less will be occluded in the precipitate.

soluble in cold water. It is impossible to occlude the whole of the mercuric salt, because the presence of water during precipitation cannot be altogether avoided. If, with a view to economy, a smaller quantity of mercuric salt be employed in proportion to the zinc salt, mercuric cyanide is still dissolved and a diminished quantity is found to be occluded. Under the most favorable circumstances about half of the mercuric cyanide is washed away, but the salt may of course be recovered by evaporating the washings. Mercuric sulphate cannot be advantageously substituted for mercuric cyanide, since, although it can be dissolved in aqueous potassium cyanide, more water is needed to keep the products in solution, and therefore less of the mercuric salt is occluded.

The Manufacture of Compressed Yeast.

From a thesis "On the Manufacture of Compressed Yeast and its Detrimental Germ Impurities," presented by Alfred J. M. Lasché to the School of Pharmacy of the University of Wisconsin, we take the following description of the usual mode of manufacture:

a. Preparation of the Mash.—3,130 pounds of ground corn are mixed with 4,500 gallons of water. This mixture is heated to 190° F. (to swell the starch and thereby facilitate its inversion) and subsequently cooled to 154° F., then 1,920 pounds of ground rye and 550 pounds of ground malt are added (malt is especially employed for the amount of diastase it contains, and is indispensable in the converting process). This mixture is then allowed to stand one hour, and is finally cooled to 80° F. The proportions of the different grains are, of course, largely a matter of opinion, and the various yeast manufacturers have different working formulæ.

b. When this mash has cooled to 80° F. it is drawn off into another tub, and 1 gallon of concentrated sulphuric acid is added, in order to dissolve all the remaining starch, dextrin, and glutinous matter, and to convert them into grape sugar. Finally a quantity of compressed yeast is added to start the fermentation. This yeast settles to the bottom of the tub, but as soon as fermentation has started (usually in half an hour) and carbonic acid is being generated, a current of the latter carries the yeast to the top of the liquid. It remains there, covered by a layer of the chaffy parts of the grain, until the yeast has accumulated in a sufficiently large quantity and the current of carbonic acid has become strong enough, when it eventually breaks this film of chaffy particles and collects on the top of it in the form of foam. This goes on until all of the nutritive matter has been assimilated. The foam, containing all the yeast, rises about 2 feet above the top of the liquid, dependent on the size of the tub, and when no more effervescence is noticeable, fermentation is complete.

c. Immediately after fermentation has ceased, the foam is drawn off by means of troughs, and run, together with a fresh supply of water, into a revolving, six-sided, and declining cylinder lined with a sufficiently fine strainer. During this step of the process most all the chaffy remnants of the grain are separated, and the liquid, containing the yeast plant in suspension, is allowed to flow into a basin, whence, by means of a trough, it finally flows into a large tub.

d. The product in this tub is prevented from further fermentation by the addition of a sufficient quantity of ice. The yeast is now allowed to settle, the supernatant liquid drawn off, and the residue repeatedly washed to free it from all mechanical impurities.

e. When sufficiently cleansed it is run into a press by means of a steam pump. The press is constructed of a column of iron frames, either side of which frame being covered with a very fine straining cloth, and all the parts fitting tightly into each other. The yeast having been pumped into such a press, the water is separated from it by means of the strainer, and carried off through a waste pipe.

The yeast, now compressed, is taken out in the form of large cakes, and in this condition it is brought into commerce.—After *Pharm. Rundschau.*

The Dispensing of Digitalin.

The Paris correspondent of the *Chemist and Druggist* reports on a discussion on digitalin recently held at a meeting of the Paris Société de Pharmacie, as follows:

M. Petit called attention to the vexed question of digitalin, or rather digitalins. As regards crystallized digitalin there is no difficulty when it is prescribed as such. The dose is one-tenth of a milligramme, and it makes but little difference whether Nativelle's or the German crystalline principle (by them called "digitoxin") or any other be employed. But the trouble is with amorphous digitalins. According to law it is this sort that should be dispensed when no remark is made by the prescriber, and the preparations offered in the market as amorphous digitalins are exceedingly variable in strength. Some, such as the Codex article, which are completely soluble in chloroform, are considered by good authorities nearly equal to the crystallized principle; but others must be much weaker, since they are taken in 1-Mg. doses, which would be sure death with the pure product. As to the German sorts offered, they are of all varieties and prices, from less than 1 franc to 3 francs a gramme, not to speak of the so-called digitoxin. In consequence of this great variation, M. Petit moved that a commission be appointed on the question, so as to arrive at some agreement in regard to uniform practice in dispensing digitalin. The motion was unanimously concurred in, and MM. Petit, Marty, Wurtz, and Delpech appointed a committee to consider the matter and report.

AN IMPROVED BANDAGE ROLLER.

For over a year past a new bandage roller, devised by Mr. John Borham, one of the attendants, has been in use at Bellevue Hospital and several other public institutions. This presents some features which make it preferable to any other bandage roller we are acquainted with.

The apparatus will be readily understood by examining the illustrations. A piece of bandage muslin, of a width somewhat narrower than the inside space of the roller, is passed behind the metallic bar in front of the bottom board, then over the three wooden rectangular bars which at the same time secure the two side frames together, and, having been adjusted by its edge to the square steel axle, the latter is turned by means of a winch, thus winding the muslin tightly and smoothly upon the axle in any thickness compatible with the distance of the nearest bars. It will, of course, be readily understood that during the passage of the strip of muslin over the several sharp-edged wooden bars, every crease and unevenness is removed from it, so that the final roll produced upon the axle is perfectly homogeneous. The axle itself is slightly tapering from the winch towards the other end, and when the roll has arrived at the proper thickness, and the muslin has been cut, it is simply pulled out. The roll may then be cut with a sharp, flat-bladed knife into bandages of any desired length.

Orthrine—a New Antipyretic.

Under this name, Prof. Kobert recommends as an antipyretic a new derivative of phenylhydrazin, which has been obtained by the combination of hydrazin with para-oxybenzoic acid. This new body, orthohydrazin-para-oxybenzoate, is very unstable, but unites with hydrochloric acid, forming the hydrochlorate of orthrine, which is stable. Clinical experiments made with the new antipyretic by Prof. Unverricht show that, in 30 to 50-C.c. doses, orthrine acts in typhoid fever, pneumonia, and articular rheumatism generally with great energy; but it is uncertain, and its advantages are slight compared with its disadvantages, amongst which are profuse perspiration, collapse, and symptoms of intoxication. Michaelis has recently mentioned two other hydrazin derivatives which possess antipyretic properties; these are acetylethylenephenylhydrazin,

$$(C_6H_5)_2N_2.C_2H_4.N_2.2H(CO.CH_3),$$

and ethylenephenylhydrazin succinic acid,

$$(C_6H_5)_2-N_2-N_2.-2H(CO.C_2H_4.COOH).$$

These two substances are yet on clinical trial, and it is to be hoped that they will have shorter names if they are to go down to posterity.—*Chem. and Drugg.*

Summary on Practical Manipulation.

MR. H. N. WARREN publishes some practical notes on various chemical manipulations in the *Chem. News* (February 7th and 28th):

Precipitation.—Among the numerous operations that are performed in the laboratory, none are perhaps oftener employed than that of precipitation. Many precipitates—not among the least of which noted for tedious and imperfect filtration may be mentioned those of barium sulphate and calcium oxalate—when recently precipitated pass in considerable quantity through the pores of the paper. This may naturally be considerably retarded by employing both solutions at the boiling point. But even then considerable risks are entertained, combined with grievous waste of time. The addition of starch paste has been recommended by several experts, but the same investigators omit to state what percentage of sulphide they obtain after ignition. I may mention, as an improvement, the following method: Employ both the reagent and the solution containing the sulphate at an elevated temperature; at the same time introduce a few drops of ethereal solution of pyroxylin, and mix well with the precipitate by stirring; the pyroxylin is at once set free, and, mixing intimately with the precipitate, allows of an immediate filtration. The separation of iron from manganese by means of sodium acetate is well known to be amongst the bulkiest precipitates obtainable for practical purposes; yet if, at the boiling temperature, there be added to the precipitate finely powdered glass, it at once mechanically subsides, and, if dexterously performed, may be filtered and washed with impunity. As a third instance may be mentioned the effectual separation of precipitates occasioned during the manufacture of the pharmaceutical preparations, one of the most obstinate being the Tinctura Rhei of the British Pharmacopœia.

A sample of this description which was lately presented to my notice has been, by the manufacturers, several times ineffectually passed through various commercial filters. The sample referred to, which was, when received, of a deep cloudy slate color, due to suspended insoluble matter, was, after a short digestion with a small quantity of egg albumen, entirely freed from coherent matter by ordinary filtration. I may also mention that paper pulp distributed throughout the solution retains very perfectly any finely divided substances.

Incineration.—In cases where the total ash is required, such as the incineration of organic substances—among which may be mentioned the analysis of beet-sugar—so imperfect is the combustion of the organic matter, on account of the easily fusible salts which impregnate it, that the addition of a small quantity of H_2SO_4 is required in order to convert the inorganic salts present into sulphates, and thus render them less fusible, correction for increased weight being afterwards deducted.

The imperfect combustion of carbon when in contact with phosphates, especially in the case with magnesium phosphate, tends to increase errors; in which case, I have observed, several authors recommend the use of ammonium nitrate as a consumer of the carbon. I have, however, frequently used with success a plug of guncotton, omitting altogether a filter paper.

Precipitation Retarded.—Several organic acids or salts of the same are well known to retard the precipitation of metals when in solution. Among the most formidable are the tartrates and oxalates, also the citrates, which are not unfrequently unintentionally formed by the incautious filtration of strongly acid liquors through organic membranes; these may be altogether prevented by the employment of wool glass. They are not, however, by any means the only acids that present a retarding action, one of the most opposing being hydroferrocyanic acid. So powerful is the action of this acid, when in solution, towards the salts of tin, as not only to render the sulphide of tin unprecipitable, but even to immediately decompose it into the ferrocyanide after its formation.

Reading of Definite Quantities from Measured Flasks.—At the moment it may be desirous of denoting the exact capacity of a measured instrument, say, for instance, the reading of a measured flask, it not unfrequently happens that an accumulation of either froth or air bubbles obliterates the dimension. These may be immediately expelled by the addition of one drop of alcohol.

Disintegration.—The pulverization of many substances, before operating further upon the same, not unfrequently presents one of the most irksome and troublesome undertakings that are to be met with in a laboratory, especially when adopting the general method of pestle and mortar. Quite recently small disintegrators have been supplied for practical purposes; but the present costliness of the articles considerably retards their general application. In cases where it is required to produce to powder, such as, for instance, the pulverization of minerals, several pounds may be quickly reduced to any mesh by the application of a smooth iron plate, replacing for a pestle a large flat-headed hammer, and giving to the same a rotary motion, so as to constantly bring the same particles under its influence.

Casting and Moulding.—After the assay of a metal has been completed, it not unfrequently happens that a sample of the same is required in an elongated form in order to examine its tensile strength or other physical features. A very ready mould, and one which answers the purpose admirably on account of the non-introduction of foreign substances, may be formed by coiling round an ordinary pencil, or other convenient appendage, several thicknesses of writing paper, closing the extremity by means of a cork, and supporting the same by immersing it to the extremity into dry sand, afterwards withdrawing the core and pouring into it the intended metal. A very perfect and uniform cast is thus obtained, which may be tested by weighting the same from about every other inch in length. By this means a very good indication will at once be formed whether any liquation has preceded the casting, on account of the inconstancy either of the metal or alloy that has thus been treated. These paper moulds are not intended for metals above the melting point of zinc; for copper, iron, etc., asbestos sheeting should be used in its stead.

Combustion Tubing (how to preserve).—During a tube combustion, employing the ordinary glass tubing in general use for that purpose, direct contact of the contents will oftentimes be observed to cause, either whilst hot or when cold, a fracture of the glass, and thus prevent further use of the same; a thin strip of asbestos placed next to the glass will, in many cases, prevent breakage, and thus preserve the same tube for various further operations. Many combustion estimations may be accurately performed in an iron tube.

Unsuspected Impurity of Acids.—The impurities of the various commercial acids are generally well known, and the foreign substances most frequently found contaminating them are naturally sought for before employing the purer acids. As a rule, however, nitric acid, excepting small quantities of sulphates and chlorides, is usually supposed to escape contamination. I may, however, mention that I have frequently detected selenium in a so-called pure acid. As the acid was intended for parting gold, on account of the vigorous way in which selenic acid attacks that metal, it might, if it had escaped detection, cause considerable errors. It would be interesting to know to what extent of division the millionth part of a grain of gold would become if subjected to such an impurity.

Keratin-Coated Pills.

IT matters not, according to *Merck's Bulletin*, what medicaments are used in pills, provided they be worked up, and maintained, sufficiently dry to keep their contents from mingling with, or injuring, the keratin coating. The pills, therefore, must not only contain no appreciable moisture, but also no hygroscopic substances (such as most vegetable excipients); for evaporation in the one case might cause the pills to shrink, and absorption of moisture in the other might make them swell—thus in either case destroying the continuity of the keratin coating, and thereby foiling its purpose. The body of the pill mass may consist of a mixture, by fusion, of 1 part yellow wax with 10 parts tallow or cacao butter. Kaolin, bole, or charcoal powder may be employed as excipients.

The pills, when made from a mass prepared on the above principle and duly medicated, are, according to Dr. Bernhard Fischer, to be immersed in melted cacao butter for a moment, and then rolled in graphite powder to smooth them; then they are coated with keratin by rolling them in a solution thereof until the solution is evaporated, repeating this process (perhaps as many as ten or twelve times) until the coating is thick enough. The sufficiency of the coating may be easily determined by having a few trial pills, with, say, three-quarters of a grain of calcium sulphide in each, along with the lot to be coated, and having these of different size from the others so as to distinguish them. If one of these calcium-sulphide pills be taken, and no eructation of sulphuretted hydrogen take place within a few hours thereafter, it may safely be assumed that the coating is sufficient.

In preparing the pill mass, fatty medicaments may be united with melted wax or a cerate; while aqueous infusions or liquid extracts may be thickened up with acacia or tragacanth powder, and, if need be, with some vegetable or mineral powder as little apt to swell in water as can be selected. A cerate may be added then, if it be compatible and miscible with the rest of the mass.

The solution of keratin for pill coating is made by either of the following methods:

1. Ammoniacal solution: 7 parts keratin; digest (warming, if necessary) in a mixture of 50 parts 10-per-cent ammonia water and 50 parts 60-per-cent alcohol.

2. Acetic solution: 7 parts keratin; digest (warming, if necessary) in 100 parts glacial acetic acid.

The ammoniacal solution is adapted for pills containing pancreatin, trypsin, bile, iron sulphide, etc.

The acetic solution is adapted for pills containing salts of silver, gold, mercury, iron chloride, arsenic, creosote, salicylic acid, hydrochloric acid, etc.

In the case of chemically neutral substances compatible with either solution, as, for instance, naphthalene, it is immaterial which solution is employed.—*Chem. and Drug.*

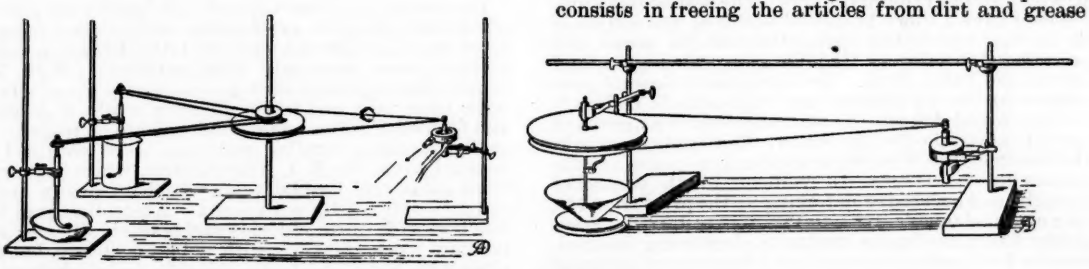
STIRRING APPARATUS.

THE use of the well-known water motor or water turbine is gradually becoming more general. E. Sauer shows (see cuts) how it may be utilized for stirring. While this is not new—one of us having used a similar apparatus years ago—yet there are some features about the arrangement which will be interesting to our readers. It is only necessary to say that the water motor is a wheel enclosed in a metallic case, and the wheel set in motion by a stream of water under pressure. The transfer of motion from the motor to the stirrer is easily understood from the cuts.—*Chem. Zeit.*

Notes on Peroxide of Hydrogen.

AT a recent meeting of the Society of Chemical Industry, Prof. Kingzett read a paper on "Peroxide of Hydrogen, its Preservation and Commercial Uses," from which we take the following (after *Journ. of Soc. of Chem. Ind.*, January 31st):

Apart from the previously well-known oxidizing properties of peroxide of hydrogen, it was proved for the first time by some experiments, of which an account was presented by me to the British Association in 1876, that this substance exhibits striking antiseptic effects, and is capable, even when present in very small proportions, of entirely arresting processes of fermentation which are originated by living organisms. The antiseptic properties of the substance were subsequently confirmed by the observations of Guttman and Fraenkel in Germany. Later still, some similar observations were made by M. Baldy, who concluded that peroxide of hydrogen is in no respect inferior to carbolic acid.



Sauer's Stirring Apparatus.

M. Paul Bert and M. Regnard confirmed my own earlier experiments, they showing (*Comp. Rend.*, '94, 1383–1386) that an extremely dilute solution of peroxide of hydrogen prevents the fermentation of glucose by the agency of yeast, prevents mycodermic growth in red wines, lactic fermentation in milk, and the putrefaction of albumen, etc. On the other hand, they found that it was incapable of arresting the changes which are induced by soluble non-organized ferments, such as diastase. This distinction is of importance, because if peroxide of hydrogen be employed for internal administration it affords a guarantee that the presence of that substance in the human system will not arrest or interfere with the many assimilative and other processes which are carried on by means of ferments of the pancreatic type.

It was, therefore, to be expected that this compound would be found of peculiar benefit for the treatment of wounds, and for general use in the practice of antiseptic surgery; and that anticipation has been amply realized in the practice of M. Baldy, M. Regnard, and particularly that of M. Péan in the Hospital of St. Louis. It has been demonstrated beyond question that all wounds which are treated with peroxide of hydrogen progress well, healing by first intention, all discharges being healthy in character and free from odor. Chronic ulcers are similarly treated with the same successful results, so also cases of gangrene, fetid suppurations, and bad ozænic discharges.

M. Péan performed many important operations in an atmosphere impregnated with peroxide of hydrogen instead of carbolic acid, and M. Baldy employed gauze and wool which had been soaked in peroxide, for placing in contact with wounds by means of bandages where prolonged contact was desirable. He also found that it might with safety be used as an injection for washing out cavities.

Dr. A. W. Harlan, in a paper read before the American Dental Society (*Dental Record*, November, 1882), strongly recommended the use of peroxide in the treatment of blind alveolar abscesses and pyorrhœa alveoli, because the rapid evolution of oxygen gas effects a thorough evacuation of the pus without creating any undesirable after-effects.

M. Landolt, of Paris, and Dr. J. E. Adams, of the London Hospital and Royal London Ophthalmic Hospital, have both used peroxide of hydrogen with great success in cases of purulent discharge from the conjunctiva (see *British Medical Journal*, December 9th, 1882).

Since October, 1885, Professor Hofmooke has employed peroxide with the greatest advantage in the treatment of diphtheria, while for syphilitic and cancerous swellings, and wounds generally, it is now in everyday use by many of the most eminent surgeons at home and abroad.

In a recent paper (read before the Kings County Medical Association, February 5th, 1889, during a discussion on diphtheria), Dr. E. R. Squibb, of Brooklyn, says: "If diphtheria be at first a local disease and be auto infectious—that is, if it be propagated to the general organism by a contagious virus located about the tonsils—and if this virus be, as it really is, an albuminoid substance, it may and will be destroyed by this agent upon a sufficient and sufficiently repeated contact."

Peroxide of hydrogen never fails to thoroughly cleanse all mucous surfaces. It not merely exhibits the power of destroying pus and other products by oxidation, but it is admitted by the most reliable bacteriologists to be an exceedingly powerful germicide, ranking, perhaps, in this respect next to biniodide of mercury, while, as distinct from that substance, it is quite non-poisonous.

As all air-breathing animals depend upon atmospheric oxygen for their very life, it stands to reason that for all diseases that are in any way dependent upon defective oxidation peroxide of hydrogen is the best natural remedy, being a solution of oxygen in chemical combination with elements of water. . . .

With respect to the use of peroxide of hydrogen for bleaching, a summary statement will suffice. It has been used, and is being used, with success for bleaching wool and woollen goods, silk (particularly tussah), ostrich feathers, living and dead human hair, sponges, ivory, bone, wash leather, horn, gut, wooden articles, etc. It may also be employed for bleaching cotton, fine yarns, and textiles, but not so successfully as for woollen goods. For such bleaching purposes tanks or vessels of wood, glass, or earthenware are employed. Metallic vessels have to be avoided. The general method of procedure consists in freeing the articles from dirt and grease by washing them with ammonia water or with dilute soda or carbonate of soda, and after having thoroughly rinsed them out they are immersed in the solution of peroxide of hydrogen, sometimes used of 10 volume strength and at other times of only 2-volume strength; frequently ammonia or some other alkali is added to the solution of peroxide in order to facilitate the bleaching.

The operation of bleaching is generally carried out at a temperature of about 30° to 50° C., heat being employed in the form of steam carried through a leaden coil immersed in the bath.

As I have previously pointed out, the addition of an alkali in order to hasten the effect is made at the expense of using an extra amount of peroxide, and in my opinion borax would replace it to advantage where it is necessary to employ such an agent for facilitating the operation.

[*Note by Ed. Am. Drugg.*—According to the English Patent, No. 15,993, granted to C. T. Kingzett, of London, peroxide of hydrogen in aqueous solution may be preserved by adding to it a small quantity, say one per cent, of any of the following substances: alcohol, acetic acid, chloral, chloroform, or glycerin. Alcohol is the preferable preservative.]

Reaction for Cocaine.—The cocaine to be tested is dissolved in water, and a drop of ferric chloride solution is added. On boiling the solution, an intense red color is developed, owing to the formation of benzoic acid. Benzoylecgonine also gives this reaction, but this substance differs considerably from cocaine in melting point and solubility. Cocaine is readily soluble in ether; benzoylecgonine is not soluble.—O. LERCH and C. SCHAERGES in *Schweiz. Woch. f. Pharm.*

Expenses of the London Hospital for medical supplies and stimulants during the year 1889 were 7,090*l.* 9*s.* 8*d.* Drugs and chemicals came to 3,858*l.* 5*s.* 4*d.*; wines, 88*l.* 10*s.* 5½*d.*; spirits 425*l.* 7*s.* 7*d.* (brandy alone 345*l.* 3*s.*); plasters 290*l.* 15*s.* 2*d.*, and the remainder on sundries, which include all surgical appliances, invalids' food, bottles, etc. Among the supplies we find enumerated gum arabic 208 lbs., cocaine hydrochlorate 44 oz., chloral 9¼ lbs., sulphonal 74 oz., antipyrin 350 oz., homatropine sulphate 649¾ grains, ichthyol 18 lbs. (increase), lanolin 35 lbs. (decrease), vaseline 3,750 lbs. (increase), menthol cones 66 doz., iodoform 244 lbs. (increase), sublimate gauze 2,066 yds. (decrease by nearly one-half from 1888), etc.

The Reddening of Carbolic Acid.

THE reddening of carbolic acid has long been a subject of controversy. The latest contribution on the question is made by Schneider (*Pharmac. Centralhalle*), who made sundry experiments to determine whether the new synthetic carbolic acid was subject to reddening in the same degree as the coal-tar product. Schneider placed samples of liquefied acid (both synthetic and coal-tar) along with specimens of cork, wood, zinc, tin, lead, iron, and other materials. The samples were put away for three months, at the end of which time the synthetic acid placed with the materials named had become slightly yellow, and the coal-tar acid samples more reddish yellow. Synthetic acid, placed in contact with metallic copper, became vivid red after a few days, and this color remained constant at the end of a period of three months. With coal-tar acid the red was assumed even more rapidly, but in this case the sample quickly changed into a brown liquid. The author concludes from his experiments that that view is most likely to be correct which ascribes the reddening of carbolic acid to the presence of a slight impurity of copper, originating from the use of copper distilling apparatus. If mixed with ammonia solution and alcohol, synthetic carbolic acid acquires the characteristic blue coloration of copper, as does the coal-tar acid, though not so rapidly.—*Chem. and Drugg.*

Notes on some Gum Samples.

MR. T. MABEN, at a meeting of the North British Branch of the Pharm. Soc. of Great Britain, reported the results of a study of some commercial gums. There were twenty-one samples in all, and they comprised Egyptian, East Indian, West African, Cape, Australian, and Brazilian gums. Commencing with a sample of picked Kordofan gum, which showed the characters of the best acacia gum, Mr. Maben gave a short historical notice of the course of trade in this commodity during the past few years, and then referred briefly to Geddah gum, Aden gum, and Ghezirah and Talca gums. Two samples of Senegal gum ("gomme du Bas du Fleuve" and "gomme de Galam") were shown and described, and an account was given of the gum trade on the Senegal River. This trade is entirely in the hands of the French, and some few years ago the Bordeaux merchants formed a syndicate for the control of the article, and succeeded in forcing up the price from 52*s.* 6*d.* per cwt. in January, 1885, to 125*s.* in April, 1888. Since that time there has been a gradually slackening demand, and in the last market report of the *Chemist and Druggist* (February 15th) it was stated "that there has been a serious decline in the price of Senegal gums, both varieties being easily obtainable at 85*s.* per cwt." Many of the so-called Arabic gums now met with were said to consist of a large admixture of Senegal gum.

There were shown three samples of Barbary or Mogadore gum. White Barbary, the best variety of the three, is not unlike Turkey sorts, but is rather dirtier. It is perfectly soluble in water, gives a bright transparent mucilage, free from odor, and keeping well. This white gum is an import of rather recent date, and is thought by some to be a Soudan gum, which now finds its way by a diverted route to the northwest instead of the northeast of Africa. Five samples of East Indian Amrad gums were shown. These have already been described by Mander, and were only briefly referred to. Special attention was drawn to Cape gum, of which three samples were shown. Two varieties of this gum are imported—one the hard brown Cape, which is obtained from Acacia horrida. This has been known for many years, and is described in "Pharmacographia"; but more recently, since the closing of the Soudan, another variety has been regularly consigned to the London markets. This is "soft white Cape," which is supposed to be gathered in the northern parts of Cape Colony, beyond the Orange River. A sample of fine picked white Cape showed as fine an appearance as any Kordofan gum, and so like is this to the old Turkey gums that it is thought by some that the white Cape is simply what we formerly received from the Soudan, and which is now brought by Arab traders right across Africa. This is a doubtful hypothesis, however, for if gums found their way so far south we would surely receive some by way of Zanzibar. Australian gum was next touched upon. This gum gives a thin mucilage which on standing separates, a brownish deposit settling down, with a pale, clear supernatant mucilage. The pure gum contains no tannin, but associated with it are pieces of wood, which impart a trace of tannin unless they are removed. The market for Australian gum is limited to England, but it is said to be employed to a considerable extent in Russia and Sweden. Three samples of Brazilian gum were shown, one of which was sent to Mr. Maben by Mr. E. M. Holmes from the museum at Bloomsbury Square. This gum occurs in large dark-amber or dark-brown glassy drops, and is soluble in water. The mucilage made from it is thick, but only moderately adhesive. Ghatti gum was described, and Mr. Mander and Mr. Prebble were quoted for information regarding it. The author did not regard Ghatti gum with so much favor as Mr. Mander, chiefly owing to the disagreeable mawkish flavor, which he thought would prove an obstacle to its general employment in pharmacy. Oomra gum, or, according to Prebble, "Babool gum," was shown. This gum gives a dark-colored, adhesive, viscid mucilage, which for many purposes might be useful. Referring to the relative value of the different gums for pharmaceutical purposes, the author said that the dark-colored gums, or gums which gave a dark-colored mucilage, might be at once dismissed from their notice, for, however valuable many of them might be in the arts or for the purposes of the confectioner, it was obvious that they were unsuitable in pharmacy. There remained not very many to pass an opinion upon, and these he was disposed to place in this order: Cape gum, Senegal gum, Barbary gum, the paler varieties of E. I. Amrad gums, and Ghatti gum. All these possessed good emulsifying properties, and gave a clear, good-keeping mucilage. A summary of the transactions in gum recorded in the *Chemist and Druggist* market reports was given. According to this there had been sold during the last few months:

	£	*s.*	*d.*		£	*s.*	*d.*	
Brazilian gum.....at from	1	8	0	to	3	0	0	per cwt.
Aden gum, scented "	1	10	0	"	3	0	0	"
" " unscented "	3	0	0	"	4	10	0	"
Oomra gum..... "	2	0	0	"	3	19	0	"
Australian gum... "	1	5	0	"	3	4	0	"
Ghatti gum..... "	1	8	0	"	4	14	0	"
Geddah and Talca. "	4	5	0	"	4	15	0	"
Amrad gums..... "	2	0	0	"	5	5	0	"
Cape gums..... "	2	0	0	"	5	5	0	"
Barbary or Mogadore gum..... "	2	2	0	"	5	12	6	"
Senegal gum..... "	4	2	6	"	5	15	0	"
Turkey gum ..... "	5	0	0	"	16	10	0	"

In addition to these, parcels of Cape gum have been sold for £14 10*s.*, and Mogadore for £14 5*s.*, while £25 per cwt. was asked for a parcel of fine Turkey.

The reactions of the various mucilages were gone into. All the samples gave precipitates with alcohol and ammonium oxalate, although with the latter Brazilian and Australian gums gave only faint reactions. With borax, acacia mucilage hardened into a gummy mass; similarly with basic lead and ferric chloride, while it gelatinized and formed a softer mass with silicate of potash. Generally speaking, similar reactions were obtained with Senegal gums, the E. I. Amrad gums, white Barbary, the Cape gums, and Geddah gum. Barbary brown and Amrad give only a jelly with borax. Australian gum has no reaction with ferric chloride and potassic silicate; Brazilian gum has no reaction with potassic silicate, but gelatinizes with borax and ferric chloride, and slightly with basic lead. Ghatti gum gelatinizes with all four, but only slightly with potassic silicate. Oomra gum reacts similarly to acacia, except that it is entirely unaffected by basic lead, and forms a softer jelly with ferric chloride.

The Chairman thought the communication was a very interesting one. Mr. Boa was inclined, from experience, to rank Ghatti gum as higher than Mr. Maben had placed it.—*Chem. and Drugg.*

Toxicological Notes on Opium.

PROF. HILGER, of Erlangen, in connection with Paul Küster, has made a study of the methods proposed for detecting opium, or rather its most characteristic alkaloids, in toxicological investigations. From the authors' paper in the *Mittheilungen aus dem pharmaceut. Institut, etc., der Univ. Erlangen* (ii. 291) we give the following abstract:

A preliminary study of the proposed methods led to the conviction that when phosphomolybdate of sodium or iodohydrargyrate of potassium had been used as precipitants of the alkaloids, it was never possible to isolate the latter in a colorless condition, even when the precipitates were produced in solutions of the *pure* alkaloids. Of course, to identify the separated alkaloids, it is necessary that they be obtained in as pure and colorless a form as possible.

A series of experiments were now undertaken to ascertain whether it was not possible to extract the alkaloids by suitable solvents, without taking along coloring matter. A successful method was discovered, which involves the use of plaster of Paris. The latter is well known to have the property of absorbing coloring matter and then yielding it only with difficulty to solvents.

Ten Gm. of opium were twice extracted with alcohol containing tartaric acid. The extract was freed from alcohol, and the aqueous residue made into a paste with plaster of Paris. When this had solidified it was reduced to powder. To set the alkaloids free, it was treated with a concentrated solution of sodium carbonate, and then again dried on a water-bath. The dry mass was now extracted with ether, during three hours, in a Soxhlet extractor. The ethereal solution had only a slight tint. On distilling off the ether and dissolving the residue with very dilute hydrochloric acid, it was easy to demonstrate in the solution the presence of morphine, codeine, and narcotine. The mass was then taken from the extractor, dried to dissipate the ether, then put back and extracted with chloroform, which resulted in a much more decidedly colored solution. On dissipating the chloroform and dissolving the residue as before, it still gave decided proofs of the presence of morphine and narcotine. If

the mass was then finally extracted with alcohol, the liquid obtained had a very dark color, and was found to contain still a considerable quantity of the alkaloids when tested with the usual precipitants.

It will therefore be seen that ether is the best solvent when it is necessary to obtain morphine, etc., as free from tint as possible. Yet it is only a feeble solvent, and it is therefore necessary to extend the time of extraction (to 6 or 10 hours) if satisfactory results are expected.

After giving in detail the results of certain experiments instituted to determine the action of ether upon the acidified or alkaline mass, etc., the authors finally recommend the following improved method to detect opium, or, rather, to detect narcotine, codeine, and morphine in forensic analysis:

Reduce the substance to be examined to a comminuted state, if necessary, and extract it twice with water acidulated with tartaric acid. This is best done by triturating it with the solvent to a thin magma, and digesting, each time, during one hour at a temperature of 50° to 60° C. Allow the mass to cool to 30° C. and separate the liquid portion. A good method to accomplish this is to transfer the whole mass to a filter which is provided a little above its point with a sieve plate, then to connect with the filter pump. In most cases it will be found impracticable to use a flannel strainer or paper filter. Now evaporate the obtained liquid upon a water-bath to the consistence of a thin extract, mix with about 25 Gm. of plaster of Paris (dehydrated), and warm for a little while on the water-bath so that the mass may become dry, which will take place in about 10 minutes if the gypsum was of good condition. Reduce the colored mass (which has an *acid* reaction) to powder, transfer it to a Soxhlet extractor, and extract it during three hours with ether. The ethereal extract, that is, the residue left after the evaporation of the ether, contains narcotine in so pure a state that it may be readily identified.

Next deprive the acid mass of the residual ether, mix it with a concentrated solution of sodium carbonate until it has a strongly alkaline reaction, dry it on a water-bath, and extract it again with ether in a Soxhlet apparatus during six hours. Towards the end of the operation it will be noticed that small crystals (of morphine) appear on the walls of the flask in which the ether is kept boiling. These may be removed, after the operation is completed, either with a brush or a small spatula, and readily identified as morphine. (It has first been observed by Poellnitz and confirmed by Dragendorff that when morphine is dissolved in ether it gradually passes from an amorphous to a crystalline condition, in which latter form it is extremely little soluble in ether.)

Now evaporate the ethereal solution, dissolve the residue in water acidulated with hydrochloric acid, and shake with chloroform, which will remove the last traces of narcotine. (It may be readily recognized after evaporating the chloroform.) Free the aqueous liquid from traces of chloroform by warming, render it faintly alkaline, and shake it with ether, which will take up the codeine. On evaporating the ether, very handsome and sharp reactions for codeine are obtained. Next proceed to extract the morphine, most of which is still present in the mass. This may either be accomplished by means of amylic alcohol, after Stas, or in the following manner devised by the authors:

Remove the residuary mass from the extractor, acidulate it, and extract it with alcohol. Free the dark-colored extract from alcohol, dissolve the residue in water acidulated with hydrochloric acid, mix it with freshly precipitated and well-washed aluminium hydrate, and warm gently. This results in the production of a lighter colored (yellow) filtrate, the alumina retaining some coloring matter but no alkaloids. Now add to the filtrate some freshly precipitated lead oxide and enough subacetate of lead solution to produce an alkaline reaction. Mix the lead precipitate with sand, dry the mixture, and extract it with chloroform. Upon evaporation of the latter, the residue will give the reactions of morphine.

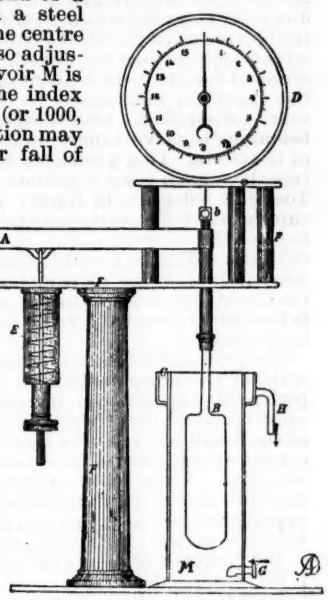
Somnal.—Radlauer has patented and brought upon the market a soporific to which he assigns the formula

$$CCl_3 - C \begin{cases} OC_2H_5 \\ H \\ NH.COO.C_2H_5 \end{cases}$$

which is the substance known as *somnal*. He prepares it by heating a mixture of equal parts of chloral hydrate, urethane, and alcohol to 100° C. E. Ritsert disputes the possibility of such a mode of preparation; there is no evidence of any reaction occurring when these bodies are mixed cold, no chloral ethylate is formed at 100° C., and chloral urethane is decomposed at 100° C. Although chloral hydrate will give no reaction, chloral will, and one obtains chloral alcoholate or chloral urethane according to the order of addition of the reacting substances, the product being in one case unattacked by the subsequent addition of alcohol, and in the other of urethane. "Somnal" is therefore nothing but a mixture of chloral hydrate, urethane, and alcohol.—*Pharm. Zeit.* and *Journ. Soc. Chem. Ind.*

A NEW SPECIFIC GRAVITY INDICATOR (BAREOSCOPE).

J. V. Divis has constructed an apparatus which permits the quick reading off of the specific gravity of a liquid. The apparatus is specially designed for liquids which are obtained in large works, and which are of a gradually increasing or decreasing specific gravity; for instance, mother-liquids, saccharine or glycerin solutions, lixiviation waters, saline solutions, etc. Any of these liquids is conducted into the reservoir M through the tube G, and passes out through H, thus maintaining always the same level. The reservoir contains a float, B, which is buoyed up by the liquid in proportion to its density. The float is carried at the end of a lever turning at *a* upon a steel point, and supported in the centre by a spring, E, which is so adjustable that when the reservoir M is filled with pure water, the index of the dial will point to 0 (or 1000, whatever kind of graduation may be adopted). The rise or fall of the float is transmitted to the index by a string.—After *Zeitsch. f. angew. Chem.*



[It is probable that this apparatus will not permit the determination of very accurate specific gravities. Yet it will no doubt save much time and labor in many operations. It could be employed in various pharmaceutical operations on a large scale, by making any liquid product pass through the reservoir M, so that the process may be interrupted when the density of the product falls below a certain point. If the index be connected with an electric alarm, and the point of contact can be set at will at any point of the scale, the apparatus would automatically signal the moment when the product would be on the point of falling below a set standard.—Ed. Am. Drugg.]

New Process of Titrating Alcohol with Chromic Acid.

R. Bourcart has devised a new process of titrating alcohol. First the diluted alcohol is heated with dilute solutions of potassium bichromate and sulphuric acid, and gradually oxidized, first to aldehyde and then to acetic acid. The conversion is quantitative. As is easily seen, two-thirds of a molecule of bichromate are required for the oxidation of one molecule of alcohol. The author operates in tubes sealed at both ends, or in a tube sealed at one end and closed at the other with a caoutchouc stopper, the end of which is secured in any convenient manner. After being heated for two to three hours in a boiling water-bath, the tube is let cool. The liquid is then mixed with a sufficiency of potassium iodide, so that the iodine set free may redissolve, and titrated with hyposulphite until the color passes from a dirty yellow to a yellowish green. Starch paste is then added, and the titration is continued until the dark-violet color disappears. The liquid does not become colorless, as it is colored a turquoise blue by chrome alum, which, however, does not interfere with the sharpness of the reaction. The author uses a solution of bichromate containing exactly 5 Gm. per liter (in some cases also a 1-per-cent solution), a sulphuric acid of 25 per cent (in some cases 10 per cent), a 10-per-cent potassium iodide solution, and a 2-per-cent solution of starch which has been boiled and filtered. The solutions of alcohol taken for examination are of about 0.5 per cent. To 10 C.c. of such dilute alcohol there are used about 50 C.c. of the 0.5 per cent solution of bichromate and 10 C.c. of the 25-per-cent sulphuric acid.—*Chem. News*, March 7th (*Extract*).

Preparation of Aloin.—The aloes are exhausted with amylic alcohol at the temperature of a water-bath, when most of the resinous matters remain in the residue. The liquid is filtered and evaporated, and the aloin is obtained as a crystalline mass, contaminated, however, with a small deposit of resinous matters. This product is then exhausted with cold water, the solution is filtered, and the filtrate allowed to evaporate spontaneously, when the crystals are obtained quite pure.—T. Woodruff, *Pharm. Journ.*

The Scarcity of Japanese Camphor.

THE following particulars regarding the preparation of Japanese camphor are furnished to the *Chemist and Druggist* by a firm of exporters of Japanese products at Hiogo:

The camphor forests in southern Japan are divided into two categories, which furnish the bulk of the world's camphor supplies.

In the first category are the forests which are the property of the Government and kept under the strict supervision of the forest department. They contain a considerable number of trees, but as far as the supply of camphor is concerned these forests can only be counted upon to a limited extent. At the discretion of the authorities permits are given at irregular intervals to cut down old trees in certain districts, and the production of the Government forests depends on the relative liberality with which permits are issued. On the average the Government forests furnish about one-fifth of the total quantity exported, and cannot be depended on as a regular source of supplies. On the other hand, the forests or trees belonging to private individuals are the base of the supply of the trade. That a considerable decrease of the camphor trees has taken place is beyond doubt. The provinces of Tosa and Satsuma, in former years the only sources of supply, are very nearly exhausted; but in distant parts, beyond the mountains and remote from water, camphor trees are still to be found. This is of importance, as the present high price of camphor on the spot is further enhanced by transportation through pathless regions before water, wanted for the distillation of the gum, can be reached.

The production has, under these circumstances, and in spite of the abnormally high prices now ruling, not experienced any material increase. At the same time it must be stated that there is now proceeding an extension of the distilling area over new districts—*i. e.*, in provinces comparatively bare of trees, and which up to now gave no camphor. These facts confirm the view that, however high prices may go, the average supplies will not only not experience any essential increase, but, on the contrary, become less and less in future years.

The camphor tree, like the oak, grows very slowly, and it takes several hundred years before the full size has been obtained; there is, therefore, no chance for the present generation to derive any benefit from the trees now in course of being planted. The present prices stimulate the production to the utmost, and the fresh gum is being hurried upon the market. The opinion that native speculators store the camphor in order to raise prices is totally wrong.

The largest yield of gum from the trees is obtained during the cold seasons; firstly, on account of the sap or essential oil contained in the tree then being concentrated in the big roots and the lower part of the stem, and, secondly, as the distillation can be done more efficiently by using cold water. This process is performed in a most primitive way on the banks of the nearest brook, as follows:

A hearth or circular wall of stone is constructed, 5 to 7 feet high; on this is placed an iron pan, and thereupon a tub about 3 feet high, the perforated bottom of which rests on the pan. Then the tub is wrapped up in a layer of clay, into which the roots and stem wood, cut into small chips, are placed. Water is now poured into the pan, the cover of the tub closed air-tight by clay, and fire kindled on the hearth. The steam rising from the pan pervades the chips and extracts from them the essential oil, leading it through a bamboo tube into the refrigerator, which consists of two wooden boxes, through the larger one of which, having no cover, a continuous stream of water is flowing, while the smaller one, being without a bottom, is placed on the water in the larger box, and serves as an air-tight receptable for the steam saturated with the essential oil, which after the lapse of twelve hours is thoroughly extracted from the chips. In the meanwhile camphor and camphor oil have deposited on the inside of the smaller box above the water; they are scraped off, and, by pressing them, the camphor crystals and oil are separated. The camphor thus obtained is in a very wet condition, and loses up to 30 per cent more of oil and water until it is put on board a vessel. The camphor oil is valuable, and carefully collected to be refined, thus yielding more camphor, while the refined oil is sold for exportation as camphor oil.

Hiogo is by far the most important place in Japan for the exportation of camphor, but the gum is extensively dealt in at Nagasaki also, chiefly for the wants of Hong Kong. There are no available returns for this latter port, and it is probable that its trade is gradually being more or less absorbed by Hiogo. The apparent scarcity of camphor in Satsuma and the southern provinces generally accounts for this fact, while the distilling area has extended further north—*i.e.*, into closer proximity to Hiogo. It should also be borne in mind that the camphor which is now shipped loses about 5 per cent more weight during the voyage than formerly, when the cargo was delivered by the natives in a drier condition.

Diuretin.

UNDER the name "diuretin," a sodio-salicylic compound of theobromine, corresponding to one of the so-called soluble salts of caffeine, has been introduced as an advantageous diuretic (*Apot.-Zeit.*, December 14th, page 1338). According to Dr. Gram, of Copenhagen, theobromine is a diuretic, acting directly upon the kidneys, differing from caffeine in not affecting the central nervous system, and therefore not causing sleeplessness and restlessness. It is said to have produced satisfactory diuresis in cases of renal and heart disease in which digitalis and strophanthus have been without effect. But as the free alkaloid requires about 1,600 parts of water for its solution, it is not readily absorbed, and gives rise to disturbance of the stomach. Diuretin, on the other hand, is alleged to produce the beneficial effects of theobromine without the unpleasant symptoms. It is described as occurring as a white powder containing 50 per cent of theobromine, dissolving, with the aid of heat, in less than half its weight of water, and remaining in solution after the liquid has cooled. It is administered to the extent of about 6 Gm. daily in 1-Gm. doses.—*Pharm. Journ.*

Hints for Pharmacists.

AT a meeting of the Glasgow Chemists' and Druggists' Assistants' Association, on February 19th, Mr. A. McKellar read a paper entitled "Useful Hints," the principal points of which are given in the subjoined abstract. The author said he could not claim originality for the observations set down in the paper, but it had occurred to him that some of the practical lessons learned, in a varied and sometimes painful, but, in the main, wholesome experience, might be of some little value to others at their daily work. Perhaps nothing occasioned more difficulty and vexation to the beginner in pharmacy than the apparently simple operation of

Cleaning Measures, etc. Therefore he would venture to make some suggestions in that connection. His list of detergents was not exhaustive, but he could answer for its trustworthiness.

Character of stain, etc.	Solvent.
Aniline dyes, *e.g.*, fuchsine, marking-ink, etc.	Sol. Acid. Tart.
Deposits in bottles from fluid magnesia, Parrish's syrup, Easton's syrup, Opium and cinchona preparations,	Acid. Hydrochlor.
Tr. benzoin co., storax, and most vegetable mixtures	Liq. Potassæ.
Tar, copaiba, tr. cannabis indicæ	Turpentine.
Old paint and grease stains on clothes	Chloroform.

For cleaning greasy ointment slabs nothing is equal to methylated spirit on cotton, followed by thorough washing with soap and water. The opaque film that occasionally forms in the water bottle, being chiefly of an organic nature, is at once removed by sulphuric acid, which also—diluted—instantaneously dissolves off the dirty scum so often found on opal pots, the process being attended by a very palpable evolution of H_2S. Two of the dirtiest bottles in every shop are those for Liquor Plumbi Subacet. and Tr. Ferri Chloridi. For the former strong acetic acid is recommended, but iodide of potassium, in small quantity, forming iodide of lead, and subsequent rinsing out with ammonia [solution of chloride of ammonium?—ED.], answers admirably; while for the latter, although hydrochloric acid helps, nothing but hard rubbing makes a good job. The dark stain left in a mortar in which Ethiops mineral has been made is only partially erased by hydrochloric acid, but a liberal application of elbow-grease and a piece of pumice-stone are needed to complete the renovation. The dimness observed in old liquor-potassæ bottles, being due, as was explained in the last Pharmaceutical Conference, to the chemical action of the alkali on the glass, is not removable. Greasy ointment pots are best treated with dry sawdust; and bone tallies, ink-stained and yellow, are converted into blanched blanks with the aid of dilute hydrochloric acid. For

Taking off Soiled Labels from customers' bottles—always a crucial test of a druggist's taste and conscientiousness in details—the most expeditious and effective plan is first to wet the label thoroughly, and then cautiously hold the bottle over a gas flame, when, as a rule, the label will peel off. In some high-class pharmacies a steam jet is used for this purpose, but the humbler method is quite as successful. Labels on liniment bottles, etc., are often so soaked with oil that when a repeat is wanted the prescription-book number is undecipherable; in that event, rub label lightly with piece of cotton, then moisten with benzin and dry above a gas flame, when in nine cases out of ten the figures will become legible. These exhaust most of the commoner stains, and it only remains to add a few odds and ends.

A Good Desiccator for pills, soft leaves, etc., can be devised by taking a Pears' soap box, laying a few pieces of quicklime on the bottom, and resting a jujube tin, holding the substances to be dried, on the quicklime bed, the lid of the box being, of course, shut. Quicklime is likewise of great service in preserving books stored in a damp place, several small lumps, occasionally renewed, in a book-case being an infallible protection to the books. For enamelled

goods use Brooks' soap; and, finally, if your apron string breaks off at an inopportune moment, take any button-shaped lozenge, wrap it in the corner of the apron, and tie the tape round it. This is a splendid makeshift, and gives the washerwoman a little innocent amusement picking out the knot to discover what the knob contains.—*Chem. and Drugg.*

Artificial Musk.

FROM an editorial entitled "Synthetic Musk," in the *Chem. and Drugg.* of February 1st, which has evidently been contributed by a person specially posted on this subject, we take the following:

The fact that an essential-oil grower and practical perfumer of repute, and a firm who are already able to point to the successful introduction of a product probably closely allied to the synthetic musk, have sufficient faith in the latter article to identify themselves with it, is certainly *prima-facie* evidence that the newcomer is destined to create some stir in the future. We have secured a sample of the new compound, part of which we have submitted to certain experiments, while we have distributed a portion to a few wholesale perfumers, with the request that they should put its efficiency to a practical test. The new product appears in minute, glistening white crystals. Its odor (which the inventors claim to surpass that of true musk in intensity several times) is remarkably powerful and durable, but it is not exactly that of true Tonquin musk - certainly no perfumer would confound the two. When smelled faintly, however, it is of a character decidedly akin to musk, and to the general public the two would probably be the same. We need not say that the new product is a coal-tar derivative, obtained from toluol as the starting point, though by what precise process is, of course, only known to the manufacturers. Our experiments point to the probability that the article is a member of the class of aromatic bodies of which vanillin and saccharin are typical samples. The sample which we tested dissolved readily in rectified spirit. A 1-per-cent alcoholic solution is not in itself of a musky odor, but upon diluting this solution with water the musk odor develops strongly, and remains distinctly perceptible up to 1 in 50,000. Solutions ranging in strength from 1 in 100,000 up to 1 in 720,000 still have a perceptible odor; but in these weak solutions it is not possible to say for certain that the odor is that of musk. The 1-per-cent alcoholic solution diluted with water to 1 in 2,000 is opalescent, but when further diluted to 1 in 36,000 it gradually becomes clear, and the musky odor appears to gain in intensity up to this point.

Upon diluting a 1-per-cent alcoholic solution with water to 1 in 3,000, and adding caustic soda to four times the weight of the "musk," the appearance of the solution remained unchanged, *i.e.*, opalescent. But after boiling the opalescence disappeared, and, in contrast with the non-alkaline solution, the musk odor became much more intense, and appeared to gain in the course of thirty-six hours. Similar treatment with sulphuric acid resulted in the precipitation of the "musk" in the form of needle-shaped crystals, about one-eighth inch long. This solution possessed only a very feeble musk odor, due, no doubt, to the fact that the odoriferous body had crystallized out. The alcoholic solution was neutral to test paper. A drop of it placed on blue litmus paper left no stain when the alcohol was dispelled by heat, but upon exposure to the air for a few hours a faint red spot appeared. It is probable that the body is of the nature of an acid, but although our observations point to this conclusion, they are not sufficiently definite. Mixed with a solution of attar of rose in the proportion of 10 of attar and 1 of musk, and diluted with water, the rose odor predominated at first, but when more water was added the musk began to develop distinctly.

The behavior of the new product with caustic soda would seem to indicate that it could be used as an ingredient in the manufacture of toilet soaps without destruction of the odor of the alkali. Of course, the crowning test of the value of the article can only be obtained by time, and as the musk has only been obtainable for a few weeks the wholesale druggists and perfumers who are now experimenting with it cannot yet give a definite opinion as to its merits, though in one or two English quarters we have heard views expressed which are the reverse of favorable—one of our informants assuring us that the alcoholic solution turns acid, which, if correct, would prove an insuperable obstacle to its use in perfumery.

It is among Parisian perfumers and druggists, however, that the article has been subject to the most thorough experiments so far, and inquiries in that city broadly show that the perfumers are not dissatisfied with the present results of their tests, though they speak in guarded terms, and are careful to point out that time only can show whether the perfume possesses the supreme qualification of permanency. On the other hand, the wholesale druggists generally refer to the compound in terms of some disparagement, and, at any rate, have very little to say in its favor, while the importers of musk profess themselves confident that the new product will not sensibly affect the price or the consumption of the better grades of the natural article, though they admit that for some weeks their trade has been at a standstill. The manufacturers of the article and their selling agents are very unwilling to give any information of any value, and appear to think that for the present their best policy is one of mysteriousness, if not of mystification. The wholesale price of the new product is at present from 2,500f. to 3,000f. per kilo, or from 60*s.* to 70*s.* per oz., which is rather more than half the price of the finest Tonquin grain musk. One of the French perfumers assures us that he has found the artificial article to be about 25 per cent cheaper in use than natural musk, which would scarcely bear out the claim of the manufacturers that their product is more powerful than natural musk.

Notes on Lanolin.

H. HELBING, F.C.S., lately Apotheker of the German Hospital, London, writes to the *Chemist and Druggist:*

Since my first note on "The Place of Lanolin in Pharmacy" appeared, experiments of the value of lanolin as an ointment base have been continually proceeding, with the result that several new directions for its application have come to light. I now purpose to call attention to these novel features by collecting them together into a single article, the more confidently as I am convinced that the general use of lanolin as an ointment base is only a question of time, and of how short a time may be judged by the number of opinions on the subject which daily find expression.

Popularly also the substance is widely used in the preparation of domestic remedies, and it is largely selected as a vehicle for the application of any agent the rapid absorption of which it is desired to insure; in evidence of which the use of lanolin for preparations of pine, creolin, etc., may be instanced.

Quite a household remedy in Germany, but, so far as my experience goes, not yet recognized in this country, is the ointment made according to the following formula:

Camphor	gr. xx.
Lanolin ointment base	℥ i

Mix.

This preparation is put up by many chemists as an infallible chilblain remedy, while at the same time it proves a very useful application for the slight burns of common occurrence in daily life.

Another popular formula is:

Menthol	gr. x.
Cocaine	gr. v.
Lanolin ointment base	℥ i.

Mix.

In Germany it is now quite fashionable to use combinations containing menthol as snuff for catarrh. The ointment made according to the above formula is used for the same affection, and the rapidity with which it produces alleviation when applied to the nose is described as marvellous.

Another new development in the use of lanolin consists in adding it to powders designed for toilet use. It is not surprising that such powders, particularly when intended for use in the nursery or for the complexion, are much improved by the addition of the natural skin fat, which increases the smoothness and suppleness of the surface to which they are applied. From 3 to 5 per cent of anhydrous lanolin can be easily mixed with any composition of the kind named by simply rubbing together. Although the admixture is facilitated by the previous solution of the lanolin, say, in ether, such a *modus procedendi* is not essential to success.

Quite recently the introduction of lanolin into Hebra's ointment has been also recommended, not only as a means of increasing its remedial virtues, but also because the process of manufacture, always troublesome to the pharmacist, is somewhat simplified. Dr. Goldman, in a lengthy paper in the *Therapeut. Monatsh.* on the subject, suggests the substitution of lanolin for the olive oil in the ointment, by which, he says, it will produce quite an equal product. His formula is as follows:

Oleate of Lead, freshly precipitated and pressed	100 parts
Liquid Paraffin	15½ "

Melt together on a water-bath in a porcelain dish and stir till cold.

Of this diluted lead oleate, 60 parts mixed with 40 parts of lanolin give a yellowish-white stable ointment. For the preparation of the lead oleate, the author gives the following directions:

Acetate of Lead	100 parts
Boiling Distilled Water	500 "

Dissolve, filter, and mix with a warm filtered solution of

Castile Soap	150 parts in
Distilled Water	750 "

The excess of lead solution and water are removed by powerful pressure, the mass being once washed with warm water and pressed again.

On the Solubility of some Alkaloids and their Salts in Pure Ether.

K. TAMBA has made experiments, in Prof. Hilger's laboratory, to determine the rate of solubility of certain alkaloids and alkaloidal salts in chemically pure ether, cold and boiling, and also when exposed for some time to ether vapor or boiling ether. The ether used in these experiments had first been treated with metallic sodium, and was then repeatedly rectified from caustic lime and anhydrous sulphate of copper.

[*Note by Ed Am. Drugg.*—In our judgment an additional series of experiments with an ether, not absolutely anhydrous, but of the kind and quality known as "stronger ether," would have been of special interest, as this kind is always available and sufficiently pure as a solvent.]

The method for determining the solubilities in cold ether was as follows: 0.25 Gm. of the alkaloid or its salt was reduced to powder, rendered air-dry, put into flasks of equal size together with 15 Gm. of the ether, and allowed to macerate during twenty-four hours at 17° C., the flasks being well stoppered. At the end of twenty-four hours the solutions were passed through a weighed filter into a tared flask, and each filter washed with 2 Gm. of ether. The undissolved alkaloid was thus carefully collected upon each filter. The filtrate was evaporated at a gentle heat, the flask then put for one hour into an exsiccator containing sulphuric acid, and weighed. The filter was also dried and weighed.

To determine the solubility in boiling ether, the alkaloids were heated in flasks provided with upright condensers, with ether kept boiling during five minutes.

Finally a series of experiments were made to ascertain how much of each alkaloid and salt would be dissolved if it were subjected to continuous extraction in a Soxhlet apparatus during forty minutes—20 C.c. of ether being used.

The results obtained were as follows (no experiments were made in the cases where no figures are given):

ALKALOIDS AND SALTS.	QUANTITY SOLUBLE IN 100 PARTS OF PURE ETHER		
	at 15° C.	at boil. point, 5 minutes.	by extraction 40 min.
Atropine Sulphate	0.007	0.0133	0.065
Brucine	0.5033	0.480	0.765
Colchicine	0.510	.....	.....
Morphine	0.025	0.057	0.130
Morphine Sulphate	0.033	0.007	0.075
Narceine	0.0033	.....	.....
Narcotine	0.387	0.680	2.545
Strychnine	0.0233	0.057	0.305
Strychnine Nitrate	0.0013	0.0133	0.055
Thebaine	0.5233	.....	.....
Veratrine	1.527	.....	.....

—After A. Hilger, *Mittheilungen pharm. Inst. Erlangen*, ii., 283.

Soluble Essence of Ginger.

SOME three years ago my attention was directed to this essence, and I commenced operations by an examination of the various soluble essences of ginger put forward by numerous makers, and although satisfied that there were some good individual points in most of the samples examined, yet there were but two which could be said to bear any approach to my idea of what a really good soluble essence of ginger ought to be.

At the outset, I therefore laid down what I considered should be the governing points of my work:

1. That the "essence" should be as strong as possible compatible with solubility.
2. That it should possess the fine aroma peculiar to Jamaica ginger.
3. That it should be perfectly free from capsicum. And now, after a long series of experiments, extending over a period of two years, I have at last succeeded in producing from the following formula a soluble essence of ginger quite equal to anything at present on the market:

Working Formula.

	(Brit. weights and meas.)
Ginger, in coarse powder	1 lb. 8 oz.
Alcohol (60 per cent)	2 pints 5 oz.
Water	15 oz.
	3 pints.

Shake them frequently together for ten days, then percolate, press off, and filter, obtaining 45 fluidounces. This is "not to be made up" to 60 fluidounces, but worked from as it stands.

Take of the above tincture 40 fluidounces, water 40 fluidounces, and mix; dissolve three-fourths of an ounce of phosphate of sodium in 5 ounces of boiling water, allow to cool, and then add it, shaking the mixture; next dissolve one-fourth of an ounce of fused chloride of calcium in 5 ounces of nearly cold water, and add, the whole to be again well shaken; allow to stand twelve hours, and filter.

Introduce the filtered solution into a still and distil off, at a very low temperature, 30 fluidounces, which put on one side in a bottle for further use.

Distil then a further quantity of 40 fluidounces, and allow the still to cool.

The residue in the still, which will be about 18 fluidounces, is what we require. This must now be carefully got out by rinsing the still with the 30 fluidounces first drawn over. This takes up all that is essential. Filter once more through a double-paper filter, and the product is 40 fluidounces of a fine amber-colored essence almost entirely soluble in water.

I trust the above will be found acceptable as a step towards elucidating that which hitherto seems to have been shrouded in a sort of mystery.—W. H. MCGRATH in *Chem. and Drugg.*

[*Note by Ed. Am. Drugg.*—The author has probably not had occasion to refer to the National Formulary, which contains a formula under No. 242, "Liquor Zingiberis" (Solution of Ginger, Soluble Essence of Ginger), which is mainly based on the process proposed by Mr. L. T. Stevens, of Brooklyn. See this journal, 1886, page 188.]

Orexine—A Synthetic Appetizer.

ANOTHER new member has been added to the steadily growing list of remedies for the diseases which afflict man, and ere long we shall probably have, as the *Pharmazeutische Zeitung* hints, a remedy for every condition of illness. The latest comer is, fortunately, not an antipyretic, but an appetizer. It is the hydrochloride of phenyldihydrochinazolin, and, "for short," will be known as *orexine*, which literally means appetizer, the name being derived from the Greek. The constitution of the body is represented by the formula

$$C_6H_4.N.CH.HCl.N.CH_2\,C_6H_5.$$

This base occurs in glistening needles, which contain two molecules of water of crystallization. It is insoluble in water, but its hydrochloride readily dissolves. The remedy is given in pill form, thus:

Orexine Hydrochloride ..... 30 grains.
Extract of Gentian,
Powdered Althæa Root, of each sufficient to make a mass, which is to be divided into 20 pills.
Coat with Gelatin.

Three to five of these pills are to be given once or twice a day with a large cupful of beef tea. The contemporary from whom we quote rather ironically remarks that gentian extract and beef tea are themselves good and powerful stimulants of the appetite, and leaves us somewhat in doubt as to whether the good results of orexine are due to it or to its vehicles.—*Chem. and Drugg.*

Phenylurethane.

PHENYLURETHANE is the name given to a new compound that has been commended for its antipyretic, antirheumatic, and analgesic properties by Prof. Giacomini in the Turin Academy of Medicine (*Pharm. Zeit.*, December 4th, page 740). It is represented as being a compound belonging to the aromatic group, resulting from the combination of aniline with chlorocarbonic ethyl ether, and occurring as a white crystalline powder, insoluble in water, and freely soluble in concentrated alcohol. Phenylurethane is claimed to act as an energetic and certain antipyretic, while at the same time exercising a beneficial influence on the general system. A dose of 0.5 Gm. is said to be equal to 1 Gm. of antipyrine, and to be sufficient to produce a fall in the temperature of from one to three degrees Celsius, lasting from nine to twelve hours. In acute and chronic articular rheumatism, it is said to relieve the pain and reduce the swelling in the joints, for which purpose it is given in doses of 0.5 Gm. As an analgesic, it produces in some cases a favorable result, whilst in others the result is negative. The form recommended for its administration is as a solution in Marsala wine, which is said to prevent collapse, cyanosis, and other unpleasant symptoms.—*Pharm. Journ.*

Menthol as an Antiseptic and Anodyne.—The use of menthol as an antiseptic as well as an anodyne appears to be increasing, and from the fact that it is probably the least injurious of all known antiseptics, it is likely to come still more into use as such. Menthol has also been used in the vomiting of pregnancy, with success. In the *Therapeutische Monatshefte* Dr. Weiss states that he gave it to a patient who for three weeks had vomited soon after taking every meal, and that the patient was not again sick. He gave a teaspoonful hourly of a mixture of 15 grains of menthol, 6 drachms of rectified spirit, and 1 ounce of syrup.—*Pharm. Journ.*

Liquid Soaps.

In a paper read before the recent congress of Russian Pharmaceutical Societies, Mr. Saidemann called attention to the therapeutic value of liquid soaps, which he claimed to present the advantages of being more suitable for inunction, favoring admixture of medicinal substances, and being always producible from vegetable oils, thus avoiding the use of animal fats (*Pharm. Zeit. Russl.*, December 24th, page 820). The formula recommended by him for a liquid soap is to mix 1 part of caustic potassa, dissolved in an equal weight of water, with 4 parts of olive oil and one-fourth part of alcohol, and to shake it vigorously during ten minutes. The mixture is repeatedly stirred during the next hour, then mixed with an equal quantity of water, and, after standing several days, filtered. The author states that carbolic acid incorporated with a potash soap has its caustic and poisonous properties neutralyzed, whilst its disinfectant action appears to be increased. It is also stated that the Berlin District Sanitary Commission has found a solution of potash soap in 10,000 parts of water completely to prevent the development of the splenic fever bacillus, and has recommended a solution of 15 parts in 10,000 as one of the best disinfectants.—*Pharm. J.*

Exalgin, Phenacetin, and Antifebrin.

According to Hirschsohn, exalgin is readily distinguishable from phenacetin and antifebrin by treatment of 1 Gm. with 2 C.c. of chloroform, which dissolves the exalgin completely, but leaves the other two undissolved (*Pharm. Zeit. Russl.*, January 14th, page 17). Antifebrin in aqueous solution gives, with bromine water, a bromine compound, differing therein from exalgin and phenacetin. Further, chloroform solution of exalgin with 10 volumes of petroleum ether forms a clear mixture, whilst a solution of phenacetin or antifebrin is turbid under the same condition. Hirschsohn says that this method allows of the detection of an admixture of 20 per cent of acetanilid, or 10 per cent of phenacetin, with exalgin.

It has already been pointed out (*Pharm. Journ.*, xix., 861; Amer. Drugg., 1889, 102) that antipyrin increases the solubility of quinine, and it is now stated that it exercises a similar influence upon caffeine (*Répertoire*, February 10th, page 5). M. Crinon reports that it suffices to add to caffeine a slightly superior weight of antipyrin to render it soluble in the cold, and that if heat be employed 0.5 Gm. of caffeine may be made to dissolve in 10 C.c. of water if 0.75 Gm. of antipyrin be added, the solution remaining clear on cooling.—After *Pharm. Journ.*

A New Method of Estimating Sugar in Urine.

Jean Politis proposes the following new method in *Journ. de Pharm. et de Chim.*:

I. *Copper Solution* ($\frac{1}{10}$ normal):

Copper Sulph., cryst.	24 95 Gm.
Tartrate of Potass. and Sod.	140 "
Soda, caust.	25 "
Distilled Water	to make 1,000 C.c.

II. *Solution of Sodium Hyposulphite* ($\frac{1}{10}$ normal):

Sodium Hyposulphite	24.8 Gm.
Distilled Water	to make 1,000 C.c.

III. *Iodine Solution* ($\frac{1}{10}$ normal):

Iodine	12.7 Gm.
Iodide Potassium	18 "
Distilled Water	to make 1,000 C.c.

This solution is used to establish the titer of the "Hypo." solution.

[To execute the test, the urine should be so diluted that it contains about one-tenth per cent of sugar. A preliminary trial will enable the operator to approximate this pretty closely.]

Fifty C.c. of the alkaline copper solution are heated in a porcelain capsule to boiling, next 10 C.c. of the sugar solution or urine (containing about one-tenth per cent of sugar) are added, the whole boiled for five minutes, then diluted with water to 100 C.c., and 50 C.c. of it filtered off.

The filtrate is slightly acidulated, a little excess of iodide of potassium added, and the iodine set free by the copper which had not been reduced determined by means of the one-tenth normal hyposulphite solution. The number of cubic centimeters of the latter used, deducted from 25, indicate the quantity which had been reduced by the 5 C.c. of sugar solution or urine (contained in the 50 C.c. of the filtrate).

[In most cases the urine may be diluted with 4 parts of water.]

The following example will show how the calculation is to be made:

Supposing the 50 C.c. of filtrate, obtained as above directed, had required—after the addition of iodide of potassium—11 C.c. of the hyposulphite solution to combine with the free iodine, this would be equivalent to 14 [25—11] C.c. of copper solution which had been reduced by the 50 C.c. of filtrate. Assuming the latter to contain 5 C.c. of diluted urine (1 in 5), then

1 C.c. of urine reduced 14 C.c. of the copper solution
1 C.c. of the copper solution = 0.0036 glucose

$$0.0036 \times 14 = 0.0504 \text{ ; therefore}$$

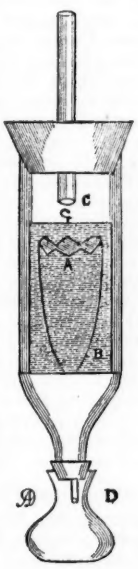
1 C.c. of urine contains 0.0504 glucose
100 C.c. " " contain 5.04 "

PLATINUM APPARATUS FOR THE ANALYSIS OF EXTRACT OF MEAT AND ALLIED SUBSTANCES.

Mr. H. N. Warren makes the following communication on "An accurate and speedy method of examining meat extracts and other substances of an allied nature by means of the new platinum extraction apparatus" to the *Chem. News* (January 10th):

The various meat extracts of commerce all depend more or less, as far as their dietetic value is concerned, on what is known as the percentage of soluble extract; or, in more technical terms, the relative amount of extract soluble in alcohol of 80 per cent. In order to accomplish this, it is requisite to dry the sample to a constant weight, either by the aid of a water-bath or hot-air sterilizer maintained at the desired temperature. To now extract the dried residue by means of alcohol, and thus obtain a general estimate of its solubility, is void of any difficulty; but to arrive at a true percentage present, an entirely new feature, insomuch that so obstinate are the gumming or solidifying properties of the remaining portion that any ordinary process—such, for instance, as the employment of a Soxhlet's tube or any form of apparatus where a limited supply of alcohol only is obtainable—remains perfectly inadequate.

The following form of apparatus, which is illustrated by the accompanying diagram, and which I am about briefly to describe, invariably results in the formation of a larger percentage of soluble extract than the various ether extractors with which I have compared it, both on account of the large bulk of alcohol that is continuously brought to play upon the enclosed residue, and at the same time retaining a much higher temperature, and, by so doing, perform the operation in less than half the usual time. A brief summary will suffice to explain the construction of the same. *A* is a tared paper which has been previously treated with alcohol. Into this is placed the dried extract, to which has been added a small quantity of carefully prepared and weighed sand, and the whole introduced into the platinum cage *B*, which is readily contrived by coiling in a spiral manner a piece of platinum gauze, turning inward the lower extremities in order to form a bottom, and furnishing the same with a cap surmounted by a small hook, while the whole is maintained in position by surrounding the same by means of the glass tube *C*, and in direct connection with the flask *D*, and containing the requisite amount of alcohol; the entire apparatus being connected by the usual method to a Liebig's condenser, whence a rapid and effectual distillation is readily accomplished—the platinum cage thus acting twofold, both by retaining any paper that may become mechanically detached by means of the alcohol, and at the same time preventing the paper from becoming attached to the sides of the outer or retaining tube, and, by so doing, retarding the influx of the alcohol. In cases where the weight of the residue is required, it forms a most effective and simple arrangement, being readily detached from the glass tube when required, and admitting of being readily weighed by suspending it from the beam of a balance by means of the small hook at the summit. In certain instances where the inorganic portion is required, it may be readily ignited without detaching the residue, and the amount estimated.



In the performance of milk analysis a rapid and accurate determination may be made as follows, a sufficiency of the sample having been evaporated in a platinum dish to a convenient bulk. A known quantity of sand, which has been thoroughly purified and tared, is placed in a paper or fine linen filter, and the milk poured into the same, the sand at once retaining, without risk of loss, the whole of the evaporated sample, which, after drying to a constant weight and deducting superfluous substances, gives the total percentage of solids; or it may be divided into two portions, using the residue for extraction of fat only, relying upon a second portion for estimation of solids.

With reference to sand, I may also state that I have frequently used with success prepared sponge as an absorbing agent. . . .

[The author appends some analytical data which prove his method to be accurate and satisfactory.]

Quantitative Determination of Citric Acid in Plants.

MR. EDO CLAASSEN, of Cleveland, Ohio, communicates a paper on the quantitative determination of citric acid in the leaves of Cephalanthus occidentalis L., and in plants generally, to the *Pharmac. Rundschau* (1889, 59). From this we translate the author's general method :

Exhaust the respective plant or part of the plant with water containing ammonia and carbonate of ammonium, concentrate the liquid somewhat, precipitate with acetate of lead, dry the precipitate and boil it with strong alcohol. Then diffuse the precipitate in water, decompose it with hydrosulphuric acid, filter, wash, and evaporate filtrate and washings to a thin syrup. To this add chloride of ammonium, an excess of ammonia, then calcium chloride and 3 volumes of alcohol. Wash the precipitate thereby produced with a mixture of 3 parts of alcohol and 1 part of water, dry the precipitate to dissipate the retained alcohol, and dissolve it in hot, very dilute hydrochloric acid. Allow to cool, filter, and evaporate the filtrate completely to dryness. Redissolve it with boiling water containing ammonia, filter at once through a tared filter, and wash with hot water. Again evaporate the filtrate and proceed as just mentioned, in order to obtain a further small portion of the substance, if possible. In case the calcium citrate which remains on the filter (or filters) is not sufficiently pure, dissolve it in the necessary quantity of hot and very dilute hydrochloric acid, allow the liquid to become cold (and filter again, if necessary), add ammonia in excess, filter again, evaporate the filtrate to dryness, and proceed as before directed.

The Action of Hydrocyanic Acid upon Calomel.

THE gray color caused by the action of hydrocyanic acid on calomel has long been known. Scheel gives the reaction: $2HgCl+2HCN=Hg+Hg(CN)_2+2HCl$. Bussy and Buiquet treated 1 Gm. of calomel repeatedly with hydrocyanic acid (1:10), and obtained 0.42 Gm. of mercury and 0.56 Gm. of mercuric chloride, and concluded that the hydrocyanic acid simply decomposed the calomel into mercury and mercuric chloride. As, however, this ran counter to thermo-chemical considerations, Mr. Fouquet repeated their experiments and obtained the same quantity of mercury left, but on examining the filtrate found it was not a solution of mercuric chloride mixed with hydrocyanic acid, but one of mercuric cyanide in hydrochloric acid, for it was strongly acid in reaction, gave no precipitate with potassa, and, if first neutralized, none with potassium bromide. On evaporating, mercuric chloride was certainly left, due to the expulsion of hydrocyanic acid by hydrochloric acid as concentration proceeded. It therefore appears that the reaction occurs in the manner indicated by Scheel; but it is never complete by a single treatment with hydrocyanic acid, for it ceases directly the proportion of hydrochloric acid present rises to a certain limit. It can be aided by neutralizing the acid as it forms, and hindered by the addition of an initial dose of acid. Pharmaceutical preparations containing hydrocyanic acid and calomel, though apt to become discolored from this reaction, are not more dangerous on account of the mercuric cyanide formed than they are from the corresponding quantity of hydrocyanic acid originally present.—*J. Pharm. et Chim.* and *J. Soc. Chem. Ind.*

Comparative Results in the Analysis of Fats.

MR. RUSSEL W. MOORE has had occasion to employ extensively the modification of the Reichert process for the determination of fats, proposed by Prof. Waller, and has made comparative trials with the Hehner or wash process. He writes of these, and of their combination, in a paper laid before the Amer. Chem. Soc. as follows (*Journ. Am. Chem. Soc.*, xi., 144) :

The modification, or rather extension, of the Reichert process is conducted as follows : The Reichert process is strictly followed out ; 2.5 Gm. of fat are saponified with 1 Gm. of caustic potassa and 50 C.c. of 70-per-cent alcohol. The alcohol, after the saponification is complete, is entirely driven off, the last portions being removed by a current of air, and the resulting soap is dissolved, with the aid of heat, in 50 C.c. of water, and decomposed with 20 C.c. of dilute sulphuric acid (1 : 10).

The flask is now attached to a condenser, preferably of the well-known upright glass worm shape furnished with a bulb tube to prevent mechanical carrying over of the acid, and exactly 50 C.c. are distilled and titrated with decinormal soda solution. The Reichert figure is thus obtained, and a certain portion of the volatile fatty acid has been removed. Fifty C.c. of water are added to the contents of the flask, the distillation is repeated, and the distillate titrated, and this same course is continued until a practically neutral distillate of 50 C.c. is obtained, that is, one requiring one-tenth of 1 C.c. of decinormal soda, or less, for neutralization. The total amount of acidity of all the distillates is now calculated as butyric acid, and the total per cent of volatile fatty acid is thus obtained.

The insoluble acids now remain in the flask and the bulb tube, or adhere to the sides of the condenser or filter used to filter the distillate. The portion in the bulb tube and condenser is rinsed into a small flask with a little hot alcohol, and that in the flask is allowed to become solid. The liquid underneath, containing sulphuric acid, potassium sulphate, and glycerin, is poured off through the filter that received the original distillate. The fatty acids are then treated with hot water several times, allowing them to cool into a cake before pouring the wash water through the filter. When the wash water shows no reaction for sulphuric acid the washing is complete. Three washings of about 100 C.c. each usually suffice for this purpose. The rinsings of the condenser are now added to the insoluble fatty acids, the filter is exhausted with hot alcohol to remove adhering fatty acid, the alcohol is expelled, and the contents of the flask are dried to constant or slightly increasing weight at 105° C. The per cent of insoluble fatty acids can then be calculated.

Bumping during distillation can be avoided by using spirals of coarse platinum wire; these can be weighed with the flask, and require no further attention.

A blank test of the reagents used should also be made, and any acidity yielded by them in the distillate allowed for.

The method conducted as above furnishes :

1. The Reichert figure.
2. The soluble fatty acids.
3. The insoluble fatty acids.

The advantages claimed for this method are as follows:

1. A combination of the two most valuable and reliable methods, the Reichert and the elaborated Hehner, into one.

2. Greater ease and rapidity of manipulation than the Dupré method.

3. Avoidance of loss of insoluble fatty acids due to transfer of the fatty acids from the flask in which the fat was originally weighed. The filter used is a small one and can easily be exhausted with hot alcohol.

4. Necessity of only one standard solution instead of four, as in the Dupré process. The decinormal soda is a very permanent solution, and the use of alcoholic potassa, which is subject to daily and even hourly change, is avoided.

The author gives a comparative table, from which it appears that this combined method gives very good results, except in the case of cocoanut oil, which contains a large proportion of fatty acids soluble with difficulty in water.

College of Pharmacy of the City of New York.—The annual meeting of the College took place on March 20th, on which occasion the largest number of members that ever participated in an election of officers of the institution put in an appearance. The following gentlemen were elected:

President—S. W. Fairchild; *Vice-Presidents*—(1) Geo. Massey, (2) W. L. Vennard, (3) Thos. F. Main; *Treasurer*—H. N. Fraser; *Secretary*—J. N. Hegeman; *Trustees to serve three years*—Ewen McIntyre, Theo. Louis, Dom. Peraza, John R. Caswell, Gust. Balser; *Trustee to fill unexpired term* (of Emlen Painter, deceased) — Alb. A. Merritt.

After the election most of the members present availed themselves of the invitation of Mr. Kemp to partake of a collation at Delmonico's, to do honor to the newly elected officers, and to more fully cement the good feeling and spirit of harmony which have always existed among the members of the College.

The present session is the most successful in the history of the institution. The Junior class numbers 151, and the Senior 121 members. Since the decease of Prof. Schrenk, the department of pharmacognosy has been placed in charge of Prof. H. H. Rusby, who will hereafter deliver the lectures on Materia Medica, Botany, and Pharmacognosy, and will conduct the practical work in botanical and pharmacognostic investigations.

A New Iodoform Industry.—Iodoform is prepared from varec soda by Suilliot and Raynaud's process at the manufactory of S. Casthélaz, Bruère & Co., at La Poterie-de-Belbeuf, near Rouen. The alkaline iodides are extracted from the varec soda by systematic washing with cold water, or by means of steam extraction, aided by a mechanical stirring apparatus. The solution obtained is desulphurized by known methods, and filtered. The clear filtrate is mixed in a large vat, provided with stirring apparatus, with sodium hydrate, acetone, and sodium hypochlorite. The iodoform which separates is purified in the usual way. The mother-liquor from these operations is worked up, first for potassium sulphate and chloride, and then for bromine.—*Journ. Soc. Chem. Ind.*

Pilocarpine in Jaundice.—Witkowski (*Therap. Gaz.*, January, page 46) considers pilocarpine to be almost a specific in jaundice, so much so, indeed, that if, after treatment lasting from ten to sixteen days, the jaundice does not disappear, he would attribute it to malignant disease. In one patient, who had suffered for four years, one-sixth of a grain of pilocarpine, subcutaneously injected once or twice daily for three weeks, caused the disappearance of the jaundice for the three years whilst under observation. Thirty analogous cases treated in a similar manner were followed with equally satisfactory results. The only cases in which it did not succeed were when the jaundice was accompanied by a tumor in the liver. He therefore recommends its use in all cases where the condition of the heart will permit it.—*Pharm. Journ.*

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ITEMS.

Dr. George Thurber.

DR. GEORGE THURBER, one of the most accomplished botanists this country ever produced, died on Wednesday night at his home, The Beeches, Passaic, the township in which he had lived for over twenty years. Dr. Thurber, who at one time was a familiar figure in "Newspaper Row," had, on account of failing health, latterly remained in strict retirement, and at the time of his death had not visited New York for nearly three years. About five weeks ago, on his removal from his old home, The Pines, to the new building occupied by his brother-in-law, George Woolson, Dr. Thurber was seized with a severe attack of rheumatism, which developed into a complication of disorders. He never rallied, and on Tuesday began to sink rapidly, being unable to articulate for many hours preceding his death.

The dead man, whose name is a household word among botanists in every part of the country, was born in Providence, R. I., on September 2d, 1821, his father being Jacob Thurber, an old resident of that city. Having received a private school education, he was apprenticed to the drug business, and even at that early age had obtained a knowledge of botany so extensive that when, in conjunction with Joshua Chapin, he began business for himself, he was master of the history and derivation of every drug in his store.

He remained in Providence until 1850, when he formed one of the special commission appointed by the Government to settle the boundary between the United States and Mexico, and took part in several of the periodical skirmishes with the Indians. Here it was that Dr. Thurber began those researches in botany that afterward made him famous, and completed a collection that comprised every plant native to Mexican soil, the majority of which had hitherto been unknown to science.

In 1853 the commission, of which Dr. Thurber had been quartermaster, was disbanded, and he came to New York, where he received an appointment in the Assay Office. He was a strong supporter of Fremont in the Presidential campaign of 1856–'57. His openly avowed abolitionist sentiments were not at all to the taste of the ruling powers in the Assay Office, who were all devoted to the cause of Mr. Buchanan, and finally Dr. Thurber had the alternative of voting for the Democratic candidate or resigning. He chose to resign, and for some time was without employment, but rented a room in the Cooper Union, where he pursued his chemical and botanical studies.

Then, in 1859, he was appointed professor of botany and horticulture in the State Agricultural College, Lansing, Mich., and while there he revised Dr. Darlington's "American Weeds and Useful Plants." In 1863 Dr. Thurber accepted the editorship of the *American Agriculturist*, and retained that place until 1885, when failing health caused his retirement. During his twenty-two years' service as editor he had sole charge of the revision and editing of all works on horticulture published by the Orange Judd Co.

In addition to the papers written by him for the *American Agriculturist* in his editorial capacity, Dr. Thurber was the author of all the articles on botany and horticulture now to be found in "Appleton's Encyclopædia," and delivered a large number of lectures on chemistry and botany at the Cooper Union and at the College of Pharmacy. In this country he was the foremost authority on grasses.

Dr. Thurber only once ventured outside America, in 1879, when he paid a brief visit to England. Since his retirement from active work he has spent most of his time in contributing occasional special papers to horticultural and botanical magazines and periodicals, the last article written by him being "The Poisonous Hairs of the Primula Obconica," for *Garden and Forest*. He was never married, but leaves a brother and three sisters.—*N. Y. Daily Tribune.*

Dr. Georg Kerner, whose death was lately announced, was one of the most successful of German chemists. He first selected the career of an apothecary, but when he went to the chemical laboratory of Professor Fresenius, in Wiesbaden, to widen his experience and education, the attractions of pure science were so powerful that he devoted himself entirely to the pursuit of chemistry. Having worked under Fresenius for a time, Kerner entered the quinine factory of Zimmer, in Sachsenhausen, near Frankfort, where he soon rose to the position of technical manager. To his ability in this post the business undoubtedly owes much. When the concern was transferred to the management of a limited liability company, Kerner retired from active business life, and at the comparatively early age of 54 left forever the crucible and retort.

Professor Joseph Schrenk, of the College of Pharmacy of the City of New York, died on March 10th at his home in Hoboken, after an illness of several months' duration. He was born on December 31st, 1842, in Transylvania, studied law at the University of Vienna, and came to this country in 1865, when he entered upon an educational career, occupying first a position as teacher at the Heidenfeld Institute, New York. His abilities and executive talents were soon recognized, and he received a call as principal of the public school at College Point, which he accepted. He was also elected director of the Poppenhusen Institute at the same place. Ten years ago he was invited to accept the position as principal at the Hoboken Academy, which he occupied up to the time of his death. For many years past he had devoted all his spare time to botanical studies, and became a recognized authority in this field of science. By nature a deep thinker, a close observer of nature, and an original investigator, he made many important contributions to systematic and structural botany. In connection with his botanical studies he also took up the field of pharmacognosy, and became one of the most accomplished experts in this branch of science. In 1882 he was appointed professor of practical botany in the College of Pharmacy of the City of New York, and some years subsequently was elected professor of pharmacognosy. In connection with these departments he also conducted the instruction in microscopy, in the practical use and application of which he had but few equals. The College has lost in him a most valuable worker, and the students a solicitous teacher and friend.

Revision of the United States Pharmacopœia.

OFFICIAL ANNOUNCEMENT.

THE convention for the revision of the United States Pharmacopœia will be held in the City of Washington, May 7th, at noon. As it is necessary that some preliminary arrangements should be prepared in advance of the convention, I have taken upon myself the responsibility of appointing the following delegates to act as a Committee of Arrangements:

Dr. Samuel C. Busey, Dr. C. H. A. Kleinschmidt, Dr. Robert T. Edes, of Washington; Mr. P. W. Bedford, of New York, and a committee appointed by the National College of Pharmacy of the following members: W. S. Thompson, J. A. Milburn, and S. E. Waggaman, M.D.

As soon as arrangements are completed, a circular will be mailed to each organization whose credentials are received by me before April 10th, and to any delegate who will forward his address on a stamped envelope enclosed to me.

As president of the convention of 1880 for the revision of the United States Pharmacopœia, I will report that up to the first day of March I have received certificates of credentials from the following list of delegates. If there are any errors in the same, either in initials or names, I would respectfully request that corrections be sent to me, P. O. Box 3281, Boston, Mass. As there are a large number of

delegates appointed whose credentials have not yet reached me, a supplementary list will be published later.

ROBERT AMORY,
President Convention 1880.

BOSTON, MASS., March 15th, 1890.

MEDICAL SCHOOLS AND COLLEGES.

Albany Medical College.—Maurice Perkins, M.D.; J. M. Bigelow, M.D.; W. P. Mason, M.D. *Alternates.*—H. E. Webster, M.D; F. G. Curtis, M.D.; W. G. Tucker, M.D.

Baltimore Medical College.—J. W. Foster, M.D.; R. H. Ellis, M.D.; J. D. Blake, M.D.

Central Medical College.—S. E. Earp, M.D.; J. B. Long, M.D.; G. W. Vernon, M.D. *Alternates.*—J. O. Stillson, M.D.; M. V. Morgan, M.D.; J. A. Sutcliffe, M.D.

Columbia Medical College (College of Physicians and Surgeons).—G. L. Peabody, M.D.

Dartmouth Medical College.—H. M. Field, M.D.

Georgetown Medical School.—C. H. A. Kleinschmidt, M.D.; G. L. Magruder, M.D.; J. I. Stafford, M.D. *Alternates.*—G. W. H. Lovejoy, M.D.; Frank Baker, M.D.; J. B. Hamilton, M.D.

Harvard Medical College.—Charles Harrington, M.D.; Francis H. Williams, M.D.

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Michigan Medical College.—H. F. Lyster, M.D.; P. C. Freer, M.D.; H. M. Hurd, M.D. *Alternates.*—R. H. Stevens, M.D.; B. F. Dawson, M.D.; J. H. Dawson, M.D.

Miami Medical College.—Daniel Milliken, M.D.

National Medical College.—D. W. Prentiss, M.D.; W. W. Johnson, M.D.; E. T. Fristoe, M.D.

New York Medical College (University Medical College).—W. M. Thomson, M.D.

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The railroads in the territories of the Trunk Line Commission, Central Traffic Association, and the Southern Passenger Association, which practically includes all the lines between New York State on the east, Chicago, St. Louis, and the Mississippi River on the west, and all the Southern States, will make the convention rate of a full fare going and one-third fare returning (on the usual conditions) to all delegates and their friends to Washington and return. In the New England States and Michigan, as also north of Chicago and west of the Mississippi River, no concession can be obtained. Circulars giving fuller particulars will be issued later.

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 2,422.—**Raspberry Syrup** (and **Clarifying of Syrup**) (Albany).

The officinal formula for Syrupus Rubi Idæi produces a very pleasant preparation, but it is perhaps not as well adapted to be used in connection with carbonated beverages, or as flavoring of lemonade, as one containing a smaller quantity of sugar. For such purposes Dieterich recommends the following formula:

Bruise 1,000 parts of raspberries, allow the pulp to stand during two days at the ordinary in-door temperature, and then express the liquid portion. Add to this 20 parts of powdered sugar, and when it is dissolved fill the juice into narrow-necked bottles so as to reach up to the neck, tie parchment paper over their mouths, and allow to ferment at in-door temperature until no more carbonic acid gas is given off, or until a sample of the juice is no longer rendered turbid when mixed with half its volume of alcohol. Then filter.

Next clarify (see further on) 500 parts of sugar with 330 parts of distilled water, so as to obtain a product of 580 parts, add 7½ parts of citric acid and afterwards 450 parts of the filtered juice. Raise once to boiling, skim carefully, and strain through flannel.

The clarification of the syrup is directed to be performed in the following manner: Mix the sugar (best, white, if possible free from blueing) with the water. After half an hour raise the mixture to boiling, and carefully skim off any scum that may form on the surface. Continue the boiling until the mixture becomes

viscid, that is, until threads can be drawn from the mass by the stirrer. Then add one-half of the quantity of water first used, and again boil and skim until the product amounts to 700 parts for every 600 parts of sugar employed.

It has been recommended to increase the keeping qualities of this syrup by adding 0.1 Gm. (1½ grains) of salicylic acid to each kilo (2 pounds) of expressed juice before fermentation, and the same amount to each kilo of the finished syrup intended for export.

No. 2,423.—**Liquor Stomalgicus** (Easton).

A formula for such a compound (literally translated, "mouth-ache liquid") has been used on the Continent of Europe. The following is the formula:

Sodium Bicarbonate	80 grains.
Borax, powdered	16 "
Oil Peppermint	5 drops.
Diluted Alcohol	½ fl. oz.
Aqueous Tinct. Rhubarb (Nat. Form.)	20 min.
Water	enough to make 10 fl. oz.

Dissolve the oil in the diluted alcohol, and the salts in a sufficient quantity of the water. Mix the two solutions, add the aqueous tincture of rhubarb and lastly enough water to make 10 fl. oz. Shake the mixture well and repeatedly during about half an hour, then filter.

A tablespoonful of it is usually mixed with about half a cupful of lukewarm water, and the mouth rinsed out with it when there is a sour taste noticeable. The tincture of rhubarb is added only as a coloring agent.

No. 2,424.—**Literature on Technology and Physics** (Baltimore).

The most useful technological dictionaries, for those who wish to translate from one language to another, are the following:

1. Tolhausen, "Technologisches Wörterbuch"; small 8vo, Leipzig, 1876. In three languages: English, French, and German, each of these being made the leading language in a separate volume.

2. Eger (Gust.), "Technologisches Wörterbuch"; 8vo, Braunschweig. In two volumes (English-German and German-English). This is more complete than the first-mentioned one, but it omits French.

The most advanced modern text book on physics is the new edition of Mueller-Pouillet's "Lehrbuch der Physik u. Meteorologie"; 9th edition, by Pfaundler. Volume 1 (containing mechanics and acoustics) and Volume 3 (containing electric science) are now complete. It is published at Braunschweig (Vieweg). Ganot's Physics is somewhat behindtime, and in many respects does not go deep enough into the subject.

No. 2,425.—**Baking Powder** (O. W.).

A good baking powder may be produced by following the formula given by Mr. C. A. Crampton, who made a special investigation, some time ago, of American baking powders. He recommends:

Bitartrate of Potassium, powdered.
Bicarbonate of Sodium.
Corn.

No. 2,426.—**Dialyzed Iron** and **Peptonate of Iron** (Reading).

So-called peptonate of iron is a solution containing peptones in combination with iron, probably by the intervention of a minute quantity of ferric chloride which remains in the compound. The following formula and directions are recommended by Dieterich. In the first formula we have substituted the corresponding preparations of the U. S. Pharm. for those of the German Pharm. As the peptonate of iron is to be prepared from the so-called "dialyzed iron," we give the latter formula first:

1. *Liquor Ferri Oxychloridi.*

("Dialyzed Iron.")

Solution of Chloride of Iron (U. S.)	87 parts.
Water of Ammonia,	
Distilled Water, each	a sufficient quantity.

Mix 75 parts of water of ammonia with 75 parts of water, and gradually pour this mixture in a thin stream, while stirring, into 77 parts of solution of chloride of iron. (The precipitate thereby produced is redissolved as fast as it is formed, and the solution acquires a dark color and now contains oxychloride.) Now add 250 parts more of water.

Next prepare a mixture of 25 parts of water of ammonia and 500 parts of distilled water, and then pour both this and the previously prepared liquid, in thin streams and under constant stirring, simultaneously into a vessel of sufficient capacity and containing 2,000 parts of water. Wash the precipitate by decantation (removal of the supernatant water by means of a siphon three times each day, and pouring on fresh water) until the wash water is free from chlorine. Now press the precipitate until it weighs only 100 parts, transfer it to a flask containing 10 parts of solution of chloride of iron (or 2.1 parts of hydrochloric acid, U. S. Ph.), and promote solution by shaking. When the precipitate is dissolved, dilute to 250 parts, allow to deposit during a few days, and filter.

Finally bring the filtrate to a spec. grav. of 1.050. This corresponds to a yield of about 280 parts.

The product must not be exposed to daylight.

2. *Liquor Ferri Peptonati.*

Solution of Oxychloride of Iron (the preceding solution)	120 parts.
Dry Peptone (Gehe's)	30 "
Solution of Soda (specific gravity 1.160)	q. s.
Hydrochloric Acid (specific gravity 1.124)	1.4 parts.
Alcohol	100 "
Aromatic Tincture (National Formulary)	10 "
Distilled Water	a sufficient quantity.

Dilute the solution of oxychloride of iron with 2,000 parts of water. Dissolve the peptone (which must contain no chloride of sodium) in 2,000 parts of water, and pour this solution, under stirring, into the iron solution. Now neutralize the mixture (which is nearly clear) very carefully and exactly with enough solution of soda (about 3 parts will be required) previously diluted with twenty times its weight of water, and wash the produced precipitate by decantation until the washings no longer contain chlorine. Then collect the precipitate upon a dense, wetted linen strainer, and allow the water to drain off. Next transfer the thick mass to a capsule, add the hydrochloric acid, and warm over a steam-bath until complete solution has taken place. Next add the alcohol (and, if required, the aromatic tincture; this is to be replaced by the same amount of water, if the product is not required to be aromatized), and enough water to produce 1,000 parts.

The product is a clear, dark reddish-brown liquid, of a strongly acid reaction, having a slight ferruginous taste, and containing 0.42 per cent of iron.

A soluble peptonate of iron can be prepared only from an oxychloride such as is obtained by the first given formula.

No. 2,427.—**Pharmacopœia Revision** (Several Inquirers).

The Convention which assembles every ten years at Washington does not do the actual work of revising the Pharmacopœia, since the details involved in this work are too numerous and require too much time and study to be settled in a few days. The object of the Convention is, first, to establish the general principles which are to be followed by the actual revisers, including, perhaps, a few of the more important details, in case it should be felt that specific instructions on one or another matter should be given; second, to appoint a Committee of Revision to carry out the plan agreed upon.

One of our correspondents thought that the text of the Pharmacopœia would be taken up seriatim, and that the members present were expected to propose changes where deemed advisable. It is safe to say that the Convention would have to remain in permanent session for many months, if it were required to undertake the actual revision itself.

No. 2,428.—**Bromine Solution for Urea Estimation** (Drs. J. H. McA. and B. F. S.).

You will find the whole method of urea estimation, and formulæ for preparing the test solutions, on page 63 of our volume for 1889.

Regarding the bromine solution, however, we would say that if it is inconvenient—as our correspondents state—to weigh the final product (525 Gm.), they may make it up to a definite measure, if they have a suitable graduated cylinder with glass stopper. The proportions of bromine and of bromide of potassium given in our April number for 1889 are intended to make 365 C.c. of product, which is not exactly the meaning conveyed by the wording of the formula. We shall, therefore, give it more correctly here. But we would say that, even if the solution is prepared according to the formula given in our last year's volume, it will answer for urea estimation just as well, since there is even then enough excess of bromine.

The best proportions for preparing the solution are:

Bromine	90 parts.
Bromide of Potassium	75 "
Distilled Water	enough to make 525 "

Into a tared graduated measuring cylinder provided with glass stopper introduce the bromide of potassium, together with 300 parts of distilled water, and dissolve by shaking. Then add the bromine carefully, and lastly enough distilled water to make up the quantity. If *grammes* are taken for *parts*, then the 525 Gm. of product will measure 365 C.c.

Instead of weighing exactly 90 Gm. of bromine, which would be very apt to destroy the balance, it is better to take the contents of, say, four one-ounce vials of bromine, to add them to the bromide-of-potassium solution, and to note the increase in weight. It will be generally a little over 90 Gm. It is then only necessary to use a little more bromide, in proportion, and to make the product up to a proportionately larger amount.

No. 2,429.—**Measuring the Capacity of a Cask** (Chicago).

The U. S. gaugers use an empirical method of gauging casks, which is carried out by means of a gauging rod upon which are different scales of graduation, suitable to

the ordinary varieties of casks. This method is based upon a purely mathematical one. Mathematically, a cask—that is, the space enclosed by the staves and heads—may be regarded as two truncated cones joined together at their base; the only difference being that the sides of the cones are not straight, but more or less slightly curved. The mathematical formula representing the capacity of these two truncated cones, or, in other words, of the contents of the cask (if it be of a normal shape), is

$$\frac{\pi l}{3}(2R^2+r^2)$$

in which π is = 3.14159 (the figure expressing the value of the circumference of a circle when the diameter is regarded as 1); l is the length of the cask, inside measure; R is the radius of a section of the cask taken at the bung-hole, and r a similar section taken at the head.

It should be remembered that the staves of a barrel are somewhat thicker at the centre than at the chime. Hence, if the bung cannot be taken out so that the inside diameter can be taken at the bung-hole, and there is nothing left but to take the outside diameter and to deduct from it the thickness of the staves as measured at the chime, it is necessary to allow for the increased thickness. A good rule is to multiply the thickness at the chime with 1.02; the product will be approximately equal to the thickness of the staves in the centre.

The rule above given for gauging a cask may be expressed in language as follows:

Add together double the square of the radius of the bung section and the square of the head section, and multiply the sum found with the product obtained by multiplying the length with 1.047197.

If the measurements have been taken in inches, the result will be cubic inches, of which 231 make 1 gallon.

There are several other formulæ which may be deduced mathematically from the stereometric figure of a cask. Without going into details, we may regard a cask as a combination of two solid bodies, viz., a cylinder with straight sides—the ends of which are formed by the two heads of the barrel—and a mantle, with curved outer and straight inner side, surrounding the cylinder. The calculation of the cylinder is a simple matter, and never varies. Its capacity is $\pi r^2 h$, that is, the product of the square of the radius, times the height, times 3.14159. It is the mantle where the difference comes in. According as the curve on its outer side is greater or smaller—and custom differs in this respect in different countries—a different formula will be required to express the cubic contents.

For casks with a more convex curve than those usually used in this country for whiskey, either of the following two formulæ will give a sufficient approximation:

$$\frac{\pi l}{60}(8D^2+3d^2+4Dd)$$

$$\frac{\pi \lambda}{9}(D+d)^2$$

in which D is the diameter of the bung-hole section, and d that of the head section.

No. 2,430.—**Crystallized Protiodide of Mercury (Mercurous Iodide)** ("New York City").

According to A. Stroman, to prepare a mercurous iodide absolutely free from mercuric iodide, it is necessary to start from a mercurous nitrate as free as possible from mercuric salt, and to take care that the mercurous nitrate be always in excess. Moreover, the resulting precipitate must be protected from the light.

Mercurous nitrate solution is prepared by acting upon 3 parts of pure mercury with 4 parts of nitric acid of specific gravity 1.185, warming the mixture after a few days *very gently* (merely to dissolve the crystals), and, if necessary, adding a little dilute nitric acid, enough to prevent recrystallization below about 70° F. On adding to such a solution a moderately concentrated solution of iodine in alcohol, in small quantities at a time, and gently agitating, yellow, shining crystalline laminæ of pure mercurous iodide are deposited. If the iodine solution is added rapidly, pure mercurous iodide is likewise produced, but in form of a yellow, flocculent precipitate.

We have no personal experience with this process, and give it merely by request. The original paper is contained in the *Berichte d. Deutsch. Chem. Ges.*, 1887, page 2818, which our subscriber may consult in the library of the College of Pharmacy.

We also recommend that he consult the paper by Mr. H. Maclagan in AMER. DRUGG., 1884, page 82.

No. 2,431.—**Oil of Tar** (R. W. S.).

This correspondent says: "Oil of tar, when freshly distilled, is colorless. How can it be preserved so, even when exposed to light, and how can it be decolorized after it has become dark colored?"

Oil of tar, so-called, is a very complex body, consisting chiefly of a terpene (oil of turpentine) and a variety of constituents of tar, volatile at temperatures up to about 390° F. It is the latter substances to which the gradual darkening of the oil is to be ascribed. There is no method or process known by which this can be prevented. By careful fractional distillation certain constituents of the oil may be isolated, but the residue would then no longer be "oil of tar." There is no way to remove the color except by subjecting the oil to renewed distillation, and each time that this is done the new product will no longer be identical with the former.

No. 2,432.—**Floor Wax** (A. J. T.).

A good preparation for waxing floors may be obtained as follows:

Yellow Wax	25 oz.
" Ceresin	25 "
Burnt Sienna	5 "
Boiled Linseed Oil	1 "
Oil of Turpentine	about 30 "

Melt the wax and ceresin at a gentle heat, then add the sienna previously well triturated with the boiled linseed oil, and mix well. When the mixture begins to cool add the oil of turpentine, or so much of it as is required to make a mass of the consistence of an ointment.

Yellow ceresin is purified ozokerite (fossil paraffin), and may be had in almost any quantity.

The burnt sienna may be used in smaller or larger quantity, according to the tint desired, or may be replaced by raw sienna, etc.

Dieterich recommends the following:

To 400 parts of boiling water add 200 parts of yellow wax; when this is melted, add 25 parts of carbonate of potassium, boil for a moment or so, then remove the vessel from the fire and add 20 parts of oil of turpentine. Stir until cool, and dilute with water to make 1,000 parts.

If the floors are well preserved, the dilution may be carried to 1,500.

The object of the potassium salt is to form an emulsion with the wax.

No. 2,433.—**Senna and its Griping Principles** (Wis.).

It is a fact long known that the resinous principles of senna possess scarcely any (if any) purgative properties. But they are reputed to be the cause of the griping which senna often produces. Some thirty years ago it was proposed to introduce senna leaves deprived of most of their resin, chiefly for the preparation of the "Species laxantes," which are a very commonly used laxative in Europe (see Nat Form., No. 333). In the first edition of the German Pharm. this preparation was ordered to contain the purified senna leaves; but in the second edition the original, unextracted leaves were again introduced, as the therapeutists on the Revision Committee did not deem the presence of the resin of sufficient importance or disadvantage.

When senna leaves are extracted with alcohol, which is best done by percolation, the resinous principles may be almost entirely removed, if the senna was in fine powder. But when the uncut leaves are thus extracted, a good deal of the resin remains behind. Natural senna leaves contain from 5 to 7 per cent of resin. Treated with alcohol, the whole leaves will retain from 2 to 2.5 per cent of the resin. The separated resin has scarcely any laxative effect.

The treatment of senna with alcohol has the further effect that it deprives it of its peculiar odor, which is disagreeable to many persons. The Nat. Form. has, for this reason, provided for a Deodorized Fluid Extract of Senna (under No. 168).

No. 2,434.—**Gelatin for Copying Pads** (H. G.).

This subscriber wants to know what kind of gelatin is best to use for copying pads. He alludes to the hectograph, and states that he knows it to be patented.

The best kind of gelatin, in our opinion, is that variety of glue which is designated as "A, extra." A cheaper grade will answer, but we should by all means prefer the former.

Break the glue into small pieces, soak them in cold water until soft, pour off the water from the soft pieces, melt the glue, and heat, constantly stirring, until all excess of water has been driven out; that is, until no more copious aqueous vapors rise. The heating should be done by steam. Next add for every pound of glue 5 pounds of glycerin; mix well, pour out into pans and let cool, carefully removing the scum and air bubbles before the mass cools.

Type-Writer Ink.—In experimenting upon a compound suitable for use as ink for a type-writing machine, Mr. Shuttleworth made the observation that many of the colors of the aniline series are soluble in castor oil. Methyl violet is especially so, and advantage can be taken of this fact to prepare an ink of remarkable power, admitting of a large number of copies being taken from the same impression. Nigrosine was not experimented with, but it would seem possible that with it a black ink of some intensity might be produced. The incorporation and solution of the aniline color in the oil can be effected on the small scale by triturating the previously powdered pigment with the oil in a mortar, the operation being sometimes facilitated by the addition of a little alcohol. Various colored inks for stamping pads might be produced in the same way, though it has not yet been determined whether such mixtures would exercise a deleterious influence on the rubber stamp.